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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 4 1942

THE TREATMENT OF SCABIES

BY

KENNETH MELLANBY, Ph.D., Major C. G. JOHNSON, R.A.M.C., and W. C. BARTLEY

A great deal of confusion exists concerning the best methods of treating scabies.* Every method has its advocates or detractors. Much of this confusion is caused by inaccuracies in diagnosis of infection and inaccuracies in assessment of cures. At the present time the disease is in the public eye, and many irritating skin conditions unconnected with *Sarcoptes* are apt to be diagnosed and treated as scabies, though, on the other hand, mild cases are often overlooked. Scabies can only be diagnosed with certainty when the mite *Sarcoptes scabiei* can be demonstrated or, at least, an unmistakable burrow seen. Another difficulty arises in assessment of cure. Many treated cases still show signs of extensive secondary impetigo or eczema even though the primary scabies has been cured. In such cases mild applications may cure the secondary complications and thus get the credit of curing scabies, which they are quite incapable of doing.

It is commonly believed that a long soak in a hot bath, followed by vigorous scrubbing, is an essential part of any scabies treatment and that this soaking and scrubbing will in itself often cure the disease. Results given below show that almost 100% of cases of scabies can be cured if efficient medicaments are used without any bath or scrubbing at all. If a well-established burrow is soaked and scrubbed, the brush can be applied vigorously to the lesion for as long as ten minutes without dislodging the parasite, and unless the scrubbing is severe enough to draw blood it is unlikely that many of the mites will be removed in this way. Really thorough scrubbing, often repeated, may sometimes cure scabies (Dixon, 1941), but this does not appear to be a practicable method for general use. Gordon and Seaton (1942a), from their work on *Notoëdres*, suggest that scrubbing may be an important preliminary part of scabies treatment. Their view is in part based on an examination of the lesions produced by *Notoëdres*; these are covered with scabs and dry exudate, whereas in human scabies live mites are seldom so protected. In spite of this, however, it is desirable that before applying a parasiticide the body should be soaked in a hot bath and rubbed well with soap, as this may enable the medicament to penetrate the skin more readily.

It is dangerous to assume that a patient has, or has not, been cured mainly because of the disappearance or otherwise of symptoms such as irritation. Some patients continue to itch for weeks after all parasites have been killed, while in other cases methods which we know to have practically no effect on the parasites will give at least temporary relief from irritation, especially if the patient believes they are efficacious. Many writers state that the methods they advocate will cure "resistant" cases which have not responded to other treatments. We have found no indication that the parasites are much more difficult to kill in some individuals than in others. There are, however, as stated above, considerable differences in the rapidity with which symptoms such as itching disappear; but a more potent acaricide does nothing to allay these symptoms—it may easily have the opposite effect.

In our experiments on the treatment of scabies we have assessed our cure primarily by an examination of the adult female mites removed from treated cases. We have developed methods by which we believe that over 90% of the ovigerous females can be detected. Samples totalling 1,200 mites removed from 441 cases suggest that about 90% of the ovigerous females seen on examining the skin are alive, the remaining 10% having died *in situ*. If only dead mites are found after treatment this suggests that the method is likely to be successful, but such results must be confirmed by a study of the relapse rate. Of 1,500 cases treated by us, approximately 1.7% had a recurrence of scabies; but as only three individuals relapsed within ten weeks we are probably safe in assuming that the recurrences were mainly reinfections. (Incidentally, a further 2.6% of patients returned apparently uncured a few days after treatment, but these were found to have no living *Sarcoptes* and merely a persistent itching, which gradually disappeared without further scabies treatment.) If, on the other hand, it is possible to find any live mites 24 hours after completing a treatment, this leaves no shadow of doubt that the treatment has not been successful. It should be noted that if even one live mite is left a recurrence of the disease is likely. It may take several weeks before the recurrence manifests itself fully, for this time must elapse before a reasonably large mite population can be built up again. Our results are based mainly on examination of the ovigerous females, but preliminary experiments suggest that the medicaments which kill these are also reasonably effective against the eggs. Incidentally, eggs killed with benzyl benzoate or sulphur seem to be "fixed" and remain normal in appearance when incubated; we therefore find it difficult to interpret Gordon and Seaton's (1942b) results, for they assessed the potency of drugs against *Notoëdres* by the percentage of eggs which degenerated after treatment. Nymphs, larvae, and adult males occur more superficially than females, and it seems unlikely that they will escape more easily. Timoney (1924) finds, with the *Sarcoptes* attacking the buffalo, that eggs are only slightly more resistant than adult females; all other stages are less resistant. We have also found that there is a very high mortality during development; if a proportion of live eggs are left deliberately they seldom give a reinfection. The chances of a reinfection where, say, 5% of the eggs survive are exceedingly remote in all but those cases with abnormally high populations of *Sarcoptes*.

Several times the advocates of a new method have suggested that it is much simpler than the old one because fewer applications of medicament are needed or because the bath and scrubbing can be omitted. These statements have been made without testing the old method to see whether it might also work under the simpler conditions. The main errors in assessment of scabies treatment have thus often led to an under-estimation of the efficacy of old methods, while at the same time the efficacy of certain new methods has been greatly over-estimated.

Details are given below of tests with most of the treatments in common use. In many cases the methods have been tried

* A full summary of recent literature concerning treatment is given by Gordon and Seaton (1942a).

with and without baths and with and without any scrubbing of the usual sites of election. In all cases the whole body, from the neck down, has been treated with the medicament. The results are summarized in the Table. The numbers of mites found may require some explanation. We hope to publish elsewhere particulars of the numbers of parasites observed in cases of scabies, but may state here that on an average there were only 12 adult females. The majority of cases have less than this number, and a very small minority have over 50. The percentage of mites killed by any method is approximately the same whether only a few parasites are found on many patients or whether a large number of parasites are found on a single patient. During the later part of the experiments certain substances which we knew to be effective—e.g., sulphur ointment—were frequently used on cases irrespective of the parasite population, so that only rather small numbers of mites could be removed after treatment. With other methods of less-well-established efficacy, cases with high parasite count were chosen in order to obtain results quickly and to avoid a mass of work in treating or re-treating cases. All patients studied were adult males, but observations made on children and females do not suggest any considerable differences.

A Comparison of Different Methods used in the Treatment of Scabies. All Results obtained 24 Hours after the First Application unless Otherwise Stated

Method	Bath	Scrub	Cases	Cure %	Mites Dead	Mites Alive	% Mites Killed
A. Sulphur							
(1) Sulphur ointment B.P. 10%	+	+	57	97	269	2	99·5
" " "	+	—	64	90	331	9	97
" " "	—	—	26	88	335	8	98
(2) Marcussen's ointment (kathiolan) ..	+	—	7	100	169	0	100
(3) Flowers of sulphur :							
Day 1	+	—	2	0	4	22	15
" 2	+	—	2	0	26	12	33
" 3	+	—	2	0	29	14	67
(4) Thiosulphate ; HCl :							
Day 1	+	—	6	0	11	33	25
" 2	+	—	3	0	31	31	50
" 3	+	—	3	66	13	5	72
(5) Sulfomil :							
Day 1	+	+	5	0	20	96	17
" 2	+	+	5	0	22	63	26
" 3	+	+	4	0	42	46	48
(6) Internal sulphur : (10 days)	—	—	4	0	0	50	0
B. Rotenone							
(1) Derris root lotion : ..							
Day 1	+	—	13	15	121	44	73
" 3	+	—	13	46	81	22	79
(2) Rotenone emulsion 2% (sarevan)	+	—	4	25	559	171	76
C. Benzyl Benzoate							
(1) 5% in spirit	+	—	5	40	225	23	91
(2) 10% " "	—	—	38	95	307	2	99
(3) " " "	+	—	64	94	737	6	99
(4) 20% " "	—	—	43	97·5	291	2	99·3
(5) " " "	+	—	52	98	301	1	99·6
(6) 25% " "	+	—	37	97	175	2	99
(7) Lotion (25% benz. benzoate, 35% soft soap, 40% spirit) ..	+	+	32	100	210	0	100
(8) " " "	+	—	9	100	30	0	100
(9) 10% emulsion	+	—	12	43	128	16	89
(10) " "	—	—	12	75	63	5	93
(11) 20% " (L.W.)	—	—	41	97·5	281	1	99·6
(12) " "	+	—	50	98	368	1	99·7
(13) " " (S.T.)	—	—	41	100	474	0	100
(14) " " "	—	—	24	100	190	0	100
(15) " " (W.F.Z.)	—	—	48	100	415	0	100
(16) " " "	—	—	21	100	106	0	100
(17) All 20% emulsions ..	+	—	225	99	1,834	2	99·9
D. Dimethyl-diphenylene Disulphide							
(1) Undiluted	—	—	6	100	178	0	100
(2) 10% in paraffin ..	—	—	3	100	81	0	100
(3) 5% " "	—	—	5	80	79	1	98·5
(4) 2% " "	—	—	2	50	62	47	57
(5) 0·5% " "	—	—	1	0	44	21	67
E. Pyrethrum							
(1) A.200 (extract in paraffin)	+	—	3	33	32	2	94
(2) Emulsion in water (2% total pyrethrins) ..	+	—	4	75	41	6	87
(3) Solution in paraffin (1% pyrethrin I, approx. 1·75% total pyrethrins):							
(*a*) Sprayed ..	+	—	9	22	91	28	71
(*b*) Painted ..	+	—	3	0	93	65	59

Sulphur Preparations

Sulphur Ointment (10% *Sulphur*).—Sulphur has been used since ancient times (see Hebra, 1868, for details) for the treatment of scabies, and sulphur ointment is a sarcopticide of proved efficacy. It has gained some notoriety because, when over-applied, a severe itching dermatitis is produced which is often thought to be due to a continuation of the parasitic infection. More ointment is then applied, with a further aggravation of the condition and, finally, disastrous results. The standard treatment consists in making three applications of the ointment, the first (and sometimes the second and third also) following a hot bath and scrubbing. Before our investigation reached the present stage, in which we can locate and extract most of the parasites, about 200 cases were treated by the above method without a single relapse being detected. In 147 cases since treated, the mites have been extracted after treatment. The results given in the Table show that a very high proportion of the mites were killed by one application, using approximately 3 oz. of sulphur ointment per patient. There is some indication here that the efficacy of the treatment is slightly enhanced by bathing and scrubbing, although the difference between the results (% killed) from the two types of treatment is not statistically significant. Even without bathing and scrubbing, very few mites survive, and two applications of the ointment have cured 100% of the cases. When skilled orderlies are available the disadvantage of the messiness of the treatment often outweighs the ease with which the medicament can be applied. We are of the opinion that sulphur ointment is likely to give more satisfactory results than other methods when used by the unskilled, for even if the ointment is carelessly applied there are chances of its spreading over a wider area than was originally covered. Adequate warning should be given against over-treatment. We have seen cases which have not been cured after using sulphur ointment for many days ; these patients have been applying the ointment locally on the irritating areas. It cannot be too strongly stressed that the whole of the body except the head must be covered.

Sulphur Vanishing Cream.—In order to avoid the messiness of sulphur ointment and to economize in the paraffin base, vanishing creams containing sulphur, obtained through the kindness of the Cooper Technical Bureau, have been tried. The creams are very pleasant to use and do not soil the garments unduly. One containing 10% of sulphur appears to be as effective as the ordinary ointment. Further research is in progress to try to decrease the sulphur content ; in 12 cases treated with a 0.5% sulphur vanishing cream the majority of the parasites were killed.

Marcussen's Ointment.—A commercial preparation of Marcussen's ointment called "kathiolan" was received through the kindness of Messrs. C. Zimmerman. It is claimed that this preparation will cure scabies within 24 hours, a contention which our experiments support. If applied as thickly as advised by the manufacturers, this ointment is even more objectionable in use than ordinary sulphur ointment, but if employed more sparingly it is equally effective and no more messy than the latter.

Flowers of Sulphur.—Flowers of sulphur dusted over a patient are said to give a simple and effective cure. The Table shows that though this treatment does kill some of the parasites it is relatively ineffective ; for after 24 hours very few mites have been killed, and even after 3 days one-third of them are still alive. It should be noted that our patients have remained in bed in contact with the powder, 60 g. of which was used for each case. It seems likely that treatments of this kind result in a race between the production of a dermatitis and the extermination of the parasite. There is a real danger that the dermatitis may develop first.

Sodium Thiosulphate and Hydrochloric Acid.—It has been thought that if the sulphur could be released in nascent form it might be particularly effective. In this method the patient is first painted with a strong solution of hypo, which is allowed to dry. Some acid (i.e., hydrochloric) is then applied to the body ; sulphur is released and conditions very harmful to *Sarcoptes* are alleged to arise. It should be noted that a patient who has been treated in this way is covered with yellow powder. This shows that the sulphur is deposited in rather coarse granules and not in a finely divided state, for in the

latter condition the deposit would be white and not yellow. We find that one application of these solutions is hardly more effective than dusting with flowers of sulphur, and even after three applications a substantial proportion of the parasites remain alive. This method is troublesome to use, and the results are so unsatisfactory that we can see no reason for continuing with it. Moreover, it lends itself to zealous over-treatment.

Sulphur Lather Tablets.—Sulphur lather preparations have been used with apparent success in America (Nolan, 1938), and samples of a similar preparation ("sulfomil") were received through the kindness of Messrs. Glaxo Laboratories Ltd. In preliminary tests these appeared to give favourable results, for patients stated that the itching was greatly relieved and no sign of any dermatitis was produced. When, however, the effect of this preparation on the parasites was assessed with greater accuracy it was not found to be more effective in killing the *Sarcoptes* than the other medicaments which deposited sulphur powder on the skin. Even after three daily applications a substantial proportion (about 50%) of the parasites were still alive.

Sulphur taken Internally.—One of us has already reported (Mellanby, 1941) that sulphur taken internally appears to have no effect on *Sarcoptes* in the skin. Even if sulphur is taken in as large a dose as can be consumed without causing severe physical discomfort (10 g. daily for 10 days) the parasites appear to be entirely unharmed at the end of the period, and fresh mites can be induced to burrow normally.

Derris Root Preparations

Derris Root Lotion.—Rotenone, which is one of the active insecticidal products from derris root and some other plants, is known to be very effective in killing many species of insects. We are informed by the Cooper Technical Bureau that tests of rotenone-containing preparations against scabies in animals have given unsatisfactory results, although these products are highly effective against insect parasites on the same animal. Further, derris is notorious for causing dermatitis in man, and unless it has substantial advantages in the treatment of scabies its use is not one which recommends itself. The derris root lotion is essentially a suspension of derris root in water (4 oz. of derris root, 1 gallon of water, a small quantity of soap flakes). The results show that it is fairly toxic to *Sarcoptes*, but even after three days 21% of the mites survived and about 50% of the patients still harboured living *Sarcoptes*. This result is much inferior to that obtained by one application of sulphur ointment. Incidentally, we obtained derris root of known rotenone content through the Cooper Technical Bureau; samples bought in the ordinary way show considerable variations in strength.

Rotenone Emulsion.—A 2% emulsion of rotenone called "sarevan" advocated for the treatment of scabies was obtained through the kindness of Messrs. Evans Sons Lescher and Webb Ltd. It is interesting to compare the proportion of rotenone in this product with that found in other medicaments. The usual strength used in animal dips in veterinary practice is 1 in 16,000; the derris root lotion mentioned above contains approximately 1 part in 1,000; sarevan contains 1 part in 50! Notwithstanding this relatively enormous concentration we have not found sarevan outstandingly successful. A number of patients were treated with 4 applications, as recommended by the manufacturers, and a satisfactory cure was obtained, but some of them developed an intractable scrotal dermatitis. One application of sarevan still left about a quarter of the mites alive, so this method also was found to be much less effective than sulphur ointment.

Benzyl Benzoate

Benzyl benzoate is by no means a new treatment for scabies. It is the main active ingredient in balsam of Peru, which has been used for a very long time. Benzyl benzoate itself, in the form of "pernol," was advocated by Sachs and Juliusberg as long ago as 1900. This medicament was, however, first popularized by Kissmeyer, who in 1937 reported very favourable results from its use. Our conclusions support Kissmeyer's results, but we find that in unskilled hands, with insufficient supervision, benzyl benzoate lotion may be applied in such a way that some burrows are missed and relapses are apt to occur.

Benzyl benzoate lotion (25% benzyl benzoate, 35% soft soap, 40% spirit), the usual form in which this compound is applied, was found to be 100% effective, and equally satisfactory cures were obtained whether or not the patient was scrubbed. As there is some difficulty in obtaining soft soap and spirit, other benzyl benzoate preparations have been tried. A simple solution in methylated or industrial spirit was very effective, even as low a concentration as 10% benzyl benzoate killing 99% of the parasites. A solution containing only 5% proved less satisfactory, though more efficient than any other anti-scabies treatment except sulphur ointment. A solution in spirit is more difficult to use than the benzyl benzoate lotion as it is not easy to distinguish which parts of the body have been covered.

Results of benzyl benzoate emulsions in water have also been tried. Several different emulsifying agents, including lanette wax S.X., cellofas, and stearic acid with triethanolamine, have been found equally effective. An emulsion containing 10% of benzyl benzoate appears to be on the weak side, giving results closely resembling those obtained with a 5% solution in spirit. It should be noted that the emulsion goes considerably further than the spirit solution, only 2 fl. oz. being required to cover the body, as against 3½ oz. of spirit solution. This means that approximately the same amount of benzyl benzoate is applied to the body with a 10% emulsion as with a 5% solution. A 20% emulsion appears to be completely satisfactory.

The National War Formulary gives a benzyl benzoate emulsion containing 25% of benzyl benzoate and 2% lanette wax S.X. The formula in the Appendix to this paper seems to us as efficient, and if many cases have to be treated it will effect important economies.

Other Sarcopticides

Dimethyl-diphenylene Disulphide (Dimethylthianthrene).—This substance, which was formerly marketed by Messrs. Bayer under the name of "mitigal," was obtained through the kindness of Imperial Chemical Industries Ltd. It is normally used undiluted on the body; it does not seem to produce any dermatitis or discomfort, and kills 100% *Sarcoptes* after one application. Unfortunately the substance is expensive in normal times, and at present is practically unobtainable. Preliminary experiments suggest that even when diluted down to 5% in medicinal paraffin it is still efficient. Work on dimethyl-diphenylene disulphide emulsions in water is now in progress.

Lethane.—Organic thiocyanates, such as lethane, are very effective against lice, and it has been suggested that they will also kill *Sarcoptes*. A 2% solution of lethane in medicinal paraffin appears to kill only about two-thirds of the mites after one application. Stronger solutions (i.e., 10%) cause the patient very considerable discomfort, and still are less efficient than benzyl benzoate or sulphur ointment.

Pyrethrum.—Various pyrethrin-containing substances have been tested. A commercial preparation containing pyrethrum extract in a petroleum jelly ("A.200") was obtained through the kindness of Messrs. Mitchell Cotts and Co. Later, substances of accurately determined pyrethrin content were prepared by Dr. J. T. Martin of the Department of Insecticides, Rothamsted Experimental Station, Harpenden. These tests do not suggest that pyrethrum extracts are particularly valuable against human scabies.

Betanaphthol.—Only two cases were treated with 10% betanaphthol ointment. Twenty-four hours after treatment 27 mites were removed; of these, 5 (18.5%) were alive. As only 2 live mites were removed from the 225 cases treated with 20% benzyl benzoate emulsion, it is clear that betanaphthol is a much less satisfactory medicament.

Discussion

The experiments described above indicate that of the treatments of scabies in common use two only, sulphur ointment and benzyl benzoate, are satisfactory. It is interesting to compare the *in vitro* reactions of *Sarcoptes* to these preparations. It is well known that the mite will survive for several days when stuck in sulphur ointment on a glass slide; we have

confirmed this observation. Sulphur ointment appears to be effective only when some active products due to the interaction of the sulphur and the human body are liberated. Benzyl benzoate, on the other hand, is rapidly lethal to the mites, which are killed within five minutes of contact away from the body.

It should be noted that it is almost impossible for a patient to apply either liquid preparations or creams satisfactorily to himself; therefore, if it is not possible to get another person (preferably trained for the purpose) to apply these remedies, it is better to use sulphur ointment treatment.

APPENDIX: DIRECTIONS FOR PREPARATION OF BENZYL BENZOATE EMULSIONS

The following three emulsions containing 20% of benzyl benzoate have been found satisfactory. If a 25% emulsion is preferred this can be made by increasing the benzyl benzoate and decreasing the water in the appropriate quantities.

Benzyl benzoate	200 mils
Lanette wax S.X.	10 g.
Water	800 mils

Melt the lanette wax on a water-bath, add the benzyl benzoate, and heat the mixture to a temperature of between 60° and 70° C. Pour the mixture into the water, previously heated to the same temperature, and stir until cold.

Benzyl benzoate	200 mils
Stearic acid	20 g.
Triethanolamine	5 mils
Water to produce	1,000 mils

Melt the stearic acid with the benzyl benzoate on a water-bath. Mix the triethanolamine with half the quantity required of warm water, and pour into the stearic acid–benzyl benzoate mixture cooled to about 30° C. Shake to form an emulsion. Add enough water to produce the required volume.

Benzyl benzoate	200 mils
1% solution of cellofas W.F.Z. ..	800 mils

Shake together to form an emulsion. Put through a cream-making machine or homogenizer.

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NARCO-ANALYSIS IN THE TREATMENT OF WAR NEUROSES

BY

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Many and diverse are the methods that have been used in exploring the meanderings of the neurotic mind. In the early days of psycho-analysis Freud (Breuer and Freud, 1893) employed hypnosis in overcoming the resistance of his patients, and, later on, in his dream analysis utilized the recurrent narcosis of natural sleep. However, the methods of psycho-analysis and all its derivatives are intricate and require considerable skill, time, and special training. In war the problem of having to deal with greater numbers of neurotics in the Services compels the profession to improvise less intricate and more rapid techniques. During the war of 1914-18 Hadfield's (1920) technique of hypno-analysis was most effective. Since 1929, research in the use of drugs as an aid to gaining insight into and rapport with patients suffering from mental and nervous illness has been in progress.

The drugs which are most useful for this purpose are the barbiturates. Bleckwenn (Lorenz, 1930) of Wisconsin, in 1929, was the first to use sodium amytal in an endeavour to gain closer rapport with his psychotic and psychoneurotic patients. Nembutal appeared in 1930, evipan in 1932, and pentothal in 1934, and these drugs have since been freely used. Other drugs that have been experimented with include cocaine, hashish, and mescaline (Lindemann and Malamud, 1934), alcohol, and medinal and paraldehyde (Hauptmann, 1934). Workers in this field also include Stungo (1938) and Campbell (1938), who employed evipan, Mallinson (1940), who has published an account of its use in the Royal Navy, and Dicks and Stungo (1940) and Sargant and Slater (1940), who have reported their experiences in the E.M.S.

The term "narco-analysis" was first devised by J. S. Horsley (1936) for the technique which utilizes a narcosis artificially induced by a barbiturate for the express purpose of facilitating the analysis of a patient's mental content. The barbiturates employed are those which have proved so useful as intravenous anaesthetics. When used as narcotics the dose is of course much smaller. In this respect it is of interest to note that hypnosis, which is the essential preliminary to hypno-analysis, was first employed in orthodox medicine as an anaesthetic by Elliotson, Esdaile, and Braid (Bramwell, 1913) for surgical operations before the discovery of chloroform or ether.

The Present Investigation

Fifty soldiers suffering from neuroses were treated by this method. The drug used was pentothal sodium—sodium ethyl (1-methyl butyl) thio-barbituric acid. It is similar in action to sodium amytal and nembutal, but safer in that it is less toxic and more readily eliminated. It is a respiratory depressant and lowers blood pressure temporarily, and is detoxicated by the liver, but has no effect upon the kidneys, so the only physical contraindications to its use are respiratory disease, low blood pressure, and liver embarrassment. These were rarely met with in healthy young neurotic soldiers. It should not be used in varicose veins if this can be avoided, because of the probability of delayed phlebitis.

Indications for Narco-analysis.—When a neurotic is admitted to hospital it is first of all essential to take a complete psychiatric history. Next a physical examination is conducted and any necessary physical treatment given. Although this has usually been done before the soldier reaches a psychological unit, it is surprising how physical signs are sometimes missed by physicians and surgeons of repute, doubtless because during their examinations the display of some gross functional symptoms by the patient has biased their judgment against a physical diagnosis. Next follow several psychological interviews in which one endeavours to explore the motives behind the symptoms. It is important to be in possession of all the facts of which the patient is consciously aware. If an impasse is reached in which the patient, though trying his best, cannot honestly remember the painful matters that have been repressed, and if this repression remains impervious to all psychotherapeutic efforts quickly applied, then one resorts to narco-analysis. It is explained to the patient simply that he will be given an injection to help him to get better. It will make him sleepy, but will have no untoward after-effects. Soldiers are at liberty to refuse injection, so it is necessary to win their approval by persuasion. At times all sorts of wild rumours have been current in the wards to the effect that (*a*) the injection will weaken the patient's will power, (*b*) under it they will be forced to say everything they wish to keep secret, and (*c*) every word uttered will be taken down by a stenographer and afterwards used in evidence against them. At times such rumours have prevented me from having a case to treat in this way for months on end, and then a few successful cases make the technique popular again.

I have found intravenous sodium pentothal of assistance in (1) hysteria in its various manifestations; (2) anxiety states; (3) the after-effects of head and spine injuries; (4) borderline psychoses, mental deficiency, and epilepsy when the diagnosis was in doubt; and (5) simulation and malingering.

Administration of the Drug.—The time chosen for injection is about 2 hours after a meal. The patient is made comfortable on a couch or bed in a quiet room and is reassured. The collar and belt are loosened and the median basilic vein is prepared for venepuncture. An ampoule containing 0.5 g. (7.5 gr.) of sodium pentothal is opened and dissolved in the barrel of a

TABLE I.—*Patients in whom the Hysterical Reaction was Predominant*

Case No.	Symptoms	Effect of Pentothal	Result
1	Amnesia, dyspepsia, vomiting	No euphoria. Dramatic abreaction of war experience. Revelation of unrequited love affair prior to service	Duty
3	Vague pains left shoulder, hip, and leg	No euphoria. Very depressed reaction, though talkative	Invalided
4	Deafness and aphonia	Marked euphoria. Relief of deafness and aphonia, revelation of detailed history	Duty
5	Anxious about eyesight	No euphoria. Depressed and lacrimose. Revealed that the symptom complained of was not real trouble	,,
8	Amnesia	Not euphoric, but loquacious. Memory recovered. Motive underlying fugue revealed to be domestic worries	,,
9	Pain in back and insomnia	No euphoria. Maniacal reaction to physical injury received nine years ago	,,
10	Sequelae of head injury	No euphoria. Unemotional account of war experiences. No head injury actually occurred. Later wept bitterly	,,
13	Pain in back	Euphoric and talkative. Revealed domestic situation in civil life as root of his trouble	Invalided
18	Amnesia following head injury	Euphoric; spoke freely, but in French. Revealed that no actual head injury occurred	Duty
22	Vague rheumatic pains	No euphoria. Vivid revelation of war experiences	,,
23	Depression with suicidal impulses	No euphoria. Unemotional revelation of domestic situation. When fully conscious, convulsive sobbing	Invalided
24	Head-wagging tic	Not euphoric; serious. Revelation of fear of which he was unaware before	Duty
26	Head injury, amnesia, war dreams	Euphoric. Memory restored. Sequelae relieved	,,
27	Constant headaches	Not euphoric; lacrimose. Personal problems revealed	,,
28	Recurrent fugues	Not euphoric. Resistance not overcome	Invalided
30	Amnesia	Not euphoric, but uninhibited. A temperamentally unstable subject simulating amnesia	Duty
32	Anxious about eyesight. Depressed and apathetic	Not euphoric, but emotional. Family troubles revealed. Eyesight not improved, but depression relieved	,,
35	Amnesia	Not euphoric, but emotional. Memory restored	,,
36	Head injury. Persistent headaches, amnesia	Not euphoric. Memory restored. Symptoms relieved	,,
38	Violent nightmares	Not euphoric. Traumatic episode revealed	,,
41	Hysterical tic	Euphoric. Domestic situation associated with tic brought to light	,,
42	Hysterical fugue	Mere suggestion that injection could restore his memory caused him to reveal that injury was consciously self-inflicted	,,
49	Anaesthetic corneae	No euphoria. Psychotic, but sensation of corneae restored	Invalided

TABLE II.—*Cases in which Anxiety Predominated*

Case No.	Symptoms	Effect of Pentothal	Result
2	Insomnia, anorexia, trembling	Euphoric, aggressive, communicative. Revealed important personal and family secrets	Duty
12	Multiple healed wounds and stammer	Euphoric and loquacious. Speech clear. Revealed important nuclear incident	,,
14	Morose and reticent	Not euphoric; emotional and agitated. No new revelations	Invalided
16	Trembling and emotional	Not euphoric. Revealed a strong maternal attachment from childhood	,,
19	Palpitations. Pain in back	Not euphoric. Communicative about Quetta earthquake and instability at home	,,
25	Confused, irritable, unable to concentrate	Not euphoric, but agitated and expressed great feeling of guilt for shooting up enemy	Duty
29	General pains. Poor memory and lack of concentration	Not euphoric. Amnesia recovered	Invalided
31	Insomnia, anorexia, amnesia	Not euphoric. Memory recovered. Revealed a fear of showing fear	Duty
33	Insomnia, war dreams, anorexia	Not euphoric. Recorded all experiences for the first time	,,
40	Fears loss of vision. Amnesia	Not euphoric. Revealed that real trouble was domestic worry	,,
43	Frequency of micturition	Not euphoric. Disclosed factors underlying origin of symptom 10 years ago and repeated now	,,
44	Nightmares and nervousness	Not euphoric. Disclosed unsuspected emotional reaction to earlier incident and a fear of showing fear	Invalided
45	Faints and palpitations	Not euphoric. Conditions causing his anxiety shown to be unconnected with war trauma	Duty
47	Headaches and insomnia	Not euphoric. Emotional and abusive, but freely informative about his war experiences	,,
48	Diarrhoea, blood in stools. Flatulence	Not euphoric. Related with marked emotion important personal experiences prior to his war trauma	,,
50	Enuresis	Not euphoric. Personal experiences prior to war revealed as chief worries	,,

TABLE III.—*Cases in which there was a History of Head Injury*

Case No.	Symptoms	Effect of Pentothal	Result
10	Chronic headaches, nervousness, irritability	Not euphoric. Unemotional account of war experience. No head injury actually occurred	Duty
18	Amnesia	Euphoric; spoke freely in French. Revealed that no actual head injury occurred	,,
26	Amnesia, war dreams	Euphoric. Memory restored. Sequelae relieved	,,
34	Depression, dizziness, trembling	Not euphoric; displayed fear and anger. Seemed to be relieved of his fear of pain	,,
35	Headaches, lassitude, tremors, palpitations, depression	Not euphoric. Memory restored. Revealed fear of showing fear	,,
36	Headaches, amnesia	Not euphoric. Memory restored. Symptoms relieved	,,
39	Headaches, dizziness, general lassitude, amnesia	Not euphoric. Memory for events immediately following head injury recovered and later corroborated. Symptoms relieved	,,

TABLE IV.—*Illnesses Predominantly Physical*

Case No.	Symptoms	Effect of Pentothal	Result
11	Complete bilateral deafness	Deafness quite unaltered by pentothal	Invalided
15	Deafness	Deafness not relieved under pentothal. E.N.T. specialist decided it was nerve deafness	,,
20	Hysterical reaction to spinal injury	Memory recovered under pentothal. Further treatment refused because of its implications	,,
46	Excessive reaction to physical injury	Was able to re-experience the emotions associated with original injury	Duty

TABLE V.—*Miscellaneous Group*

Case No.	Symptoms	Effect of Pentothal	Result
6	Amblyopia right eye, blepharospasm left	Euphoric. Blepharospasm relieved. Diagnosis of mental deficiency established	Invalided
7	Severe stammer	Not euphoric. History obtained only by means of pentothal	Transferred
17	Epilepsy?	Evidence of maternal attachments revealed. Suspected that he was making the most of his symptoms to obtain discharge from the Army	Duty
21	Deafness (functional)	Not euphoric, but revealed a history of depression with family history of suicide on both sides	Invalided
37	No symptoms	Not euphoric. Story of war injury revealed to be false. Psychopathic personality	,,

10-c.cm. syringe in chemically pure water that has been specially supplied in a sealed ampoule. This makes a 5% solution. The injection is then administered very slowly, giving only 1 c.cm. per minute (checked by the second hand of a watch). The patient is asked to count from the very first, and when he reaches 100 and is getting drowsy he is asked to count back. Very few patients have required the full 10 c.cm. This is in marked contrast with the amount required for anaesthesia, in which the dosage ranges from 0.1 to 3.4 g. for operations varying in duration from 5 minutes to 4 hours or more. In no case have I used more than 0.5 g. In the earlier cases of this series my aim was to produce a very short period of unconsciousness. However, I soon found it preferable to give a much smaller dose, so that the patient did not get so far as unconsciousness, but was drowsy and had not quite reached the stage of incoherence. Anything from 0.25 to 0.4 g. was sufficient for my purpose, depending on the individual response of the patient.

Complications.—Central respiratory paralysis with subsequent circulatory failure, if threatened, should be dealt with by artificial respiration, oxygen and CO_2 inhalation, and the administration of coramine or picrotoxin.

Results

The mortality and morbidity in my series of 50 cases was *nil*. Tovell records 6 fatalities out of 4,000 anaesthetic cases. Cameron had one fatal case in 225—that of a very fat diabetic negress who required amputation of a toe for gangrene. Our group, which was unselected, included every soldier that came under my care over a period of 13 months whose investigation was held up by resistance and who, at the same time, was fit physically to receive pentothal and could be persuaded to submit to the treatment.

Of these patients 35 showed predisposition to neurosis prior to service; 31 had suffered actual war trauma. Of the 50 patients treated in this way 33 were rendered fit for duty and 17 were invalided. About half those invalided were fit to return to good posts in civil life. In fact, in some the pronounced secondary advantage of having a good position in civil life to which to return was a factor mitigating against successful removal of the neurotic symptom.

Illustrative Case

Case 26.—A soldier, aged 33, who had been in the service for 18 months, was admitted to hospital complaining of frequent nightmares associated with war dreams and general nervousness. Four months previously he had been exposed to bomb blast and had been rendered "unconscious" for 36 hours. Amnesia for those 36 hours was complete. He had had a normal school and work record, was the second son in a family of 6 boys and girls, was happily married, and happy in his unit. No family history of mental or nervous illness was elicited. On clinical examination there were no physical signs of disease apart from coarse tremor of the limbs and somewhat exaggerated reflexes. He was considered to be a case of hysterical amnesia and suitable for narco-analysis. It was thought essential first to relieve his amnesia. He reacted extremely well to a small injection of pentothal (5 c.cm.), and became euphoric and excessively loquacious. Amongst other things he related how he had been on the verge of "a sensual indiscretion," about which he felt extremely guilty, immediately before the air raids in which he was injured. He recalled the bombing and recounted how he was thrown down violently and covered with mud, how his friends came and had him admitted to hospital, and all the details of the way the nurses and doctors dealt with him on admission. All this was confirmed later. He made an immediate improvement; he was able to recall all these experiences when he came round from the influence of the drug, and seemed to fear them no longer. For the remainder of his stay in hospital he was symptom-free and a good advertisement for other similar patients, persuading them to submit to the same therapy. He returned to duty.

The cases are presented in tabular form. Table I deals with the patients in whom the hysterical reaction predominated. Table II summarizes the cases in which anxiety states predominated. Table III deals with 7 cases with a history of head injury. Table IV deals with 4 patients whose illness was predominantly physical. Table V contains details of a miscellaneous group. The number in the first column refers to the chronological order in which they were treated. In many of the cases accurate diagnosis has been difficult, because it was found that for the most part they did not fit clinically the classical descriptions—e.g., patients predominantly hysterical in their reactions showed anxiety symptoms, and obvious anxiety neurotics at times displayed hysterical features. Again, apparent neurotics under narco-analysis revealed themselves as psychotics, and certain sufferers from physical injury displayed superimposed neurotic features.

Discussion

The advantages of this simple physical approach to the intricacies of psychological mechanisms are that it is safe, rapid, and sure: the mortality, inside the wide limits imposed by contraindications and using the small doses of pentothal advocated, is *nil*. It is a much more rapid approach to the factors hidden behind neurotic symptoms than any other form of psychotherapy except hypno-analysis, and the necessity for the services of a skilled hypnotist is eliminated. It is a sure method of getting a patient into a narcotic state without unpleasant after-effects, and the required degree of narcosis can be achieved to a nicety with very little practice by giving the injection extremely slowly, as described, and conversing with the patient all the while.

One disadvantage is that it is technically an operation: in the Army a soldier can refuse any injection or operation, and very often exercises this privilege. Rumours about the mysteries and dangers of narco-analysis are reminiscent of former outcries against the use of hypnotism and anaesthetics. Another disadvantage of making a physical approach to a neurotic patient is that he may revert to the belief that some physical defect is still responsible for the illness and persist in avoiding the psychological issue in spite of all physical examinations having proved negative.

Narco-analysis with intravenous barbiturates is not a method which at present is universally successful in overcoming resistance. There has been a good deal of irresponsible Press publicity, principally in the United States, about the use of intravenous barbiturates as "truth serum," but I have been able to trace only one scientific article on the subject in the medical literature. In this Lorenz (1932) refers to the undue Press publicity, and states that the medical profession, in its contact with the public, should seek to correct the misinformation that prevails. In the 3 cases he quotes the patients who were suspected of murder were, under the influence of sodium amytal, able to establish their innocence.

Dr. Emanuel Miller in a private communication has informed me that he was called upon to give evidence before a court martial in defence of a soldier whom he had treated for a hysterical fugue. He had used evipan narcosis in his treatment, and the material obtained from the accused by this means was accepted as evidence by the court. It is debatable whether material so obtained should ever be accepted as evidence *against* any accused person. Though memory was restored under pentothal narcosis in a number of my patients suffering from amnesia, and the material thus recovered was corroborated independently afterwards, I am not prepared to say that the truth is always revealed. The patients with whom I had success were cooperative so far as they could be, and had something to gain by being communicative when assisted by injection. No doubt, in time, this technique may be perfected so that one can be sure whether the truth is being revealed or not, and this will be a great medico-legal advance, but from the psychotherapeutic standpoint it is not so important to be sure that the repressed material is absolutely true. The hidden fears of the neurotic may be sheer fantasy and the wildest confabulations of imagination. They are none the less terrifying, perhaps more so than real dangers. Yet these fantasies are the phenomena with which we as therapists have to deal in helping our patients to adjust themselves to themselves and to their hidden fears.

The phenomena observed in the 7 cases with a history of head injury give rise to interesting speculation. Two of these, under investigation, revealed that no head injury had ever occurred; but, even in those in which there was no doubt about physical injury, restoration of memory and abreaction was followed by relief of the sequelae. It may be that in these cases there was no real brain injury and that they were similar to cases of other bodily injury followed by hysterically exagger-

ated symptoms. It is a type of injury which would repay further exploration by this method. All these men were returned to duty.

It will have been noted that a great number of these so-called war neuroses when subjected to narco-analysis revealed hitherto unsuspected data. In many of them the hidden worries brought to light had nothing whatever to do with the war, the trauma experienced in fighting being only the precipitating factor in predisposed subjects. Patients are often more ready to talk of their war experiences than they are to confide their personal and domestic worries. But it is usually the revelation of the things they least want to talk about that brings relief of neurotic symptoms. The clinical study of these soldiers suffering from neuroses has exemplified that the factors underlying both war and civilian neuroses are similar. But the war has precipitated these neuroses, and we are faced with the problem of having to deal with great numbers of psychoneuroses in the Army, in which saving of time in treatment is very important.

All sufferers from neuroses find it difficult to confide entirely in their doctors. For those in civil life who can choose their own doctor this difficulty may be somewhat diminished, but for the hospital out-patient and the soldier faced with a medical officer in uniform there is virtually no choice, and thus treatment in the ordinary way tends to be either prolonged or ineffectual. The progress made in the Services towards perfecting the technique of narco-analysis during the war will be invaluable when tackling the problem of civilian neuroses in the period of post-war reconstruction.

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POSTURING IN BRONCHOGRAPHY

BY

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In a study of the literature on bronchography one is struck by two things: first that methods of introduction of lipiodol into the bronchial tract are discussed at great length though little detail is given of posturing the patient to fill different areas of the lung; secondly, that the radiographs illustrated often show large areas unfilled. If one is demonstrating a basal bronchiectasis it is essential to exclude the same disease elsewhere if operation is contemplated. The right, middle, or left lingular lobe is also frequently unfilled, and, though all zones appear on rapid inspection of an A.-P. film to be filled, closer inspection will show that the middle-lobe bronchi are empty of oil, a fact brought out readily in a lateral view. As bronchography is primarily an investigation to locate lesions and to define their extent exactly, it is as important to know what areas are normal as to know what areas are abnormal. To outline the bronchial tree completely on one side of the chest is therefore essential, and to do this with certainty proper posturing is required as described by Erwin (1936).

Technique

It was found best to adopt a standard technique and vary it hardly at all. Assistant and radiographer should be well acquainted with the different stages so that the investigation can be performed without any waiting periods. The patient should be prepared by posturing and/or premedication if necessary, and should have been tested for iodine and cocaine sensitivity.

The Two-stage Method

By this method only one side of the chest is outlined at one sitting. The patient lies on the *x*-ray couch, with head and shoulders raised approximately 30 degrees on several pillows, the chin elevated, and the head thrown back. A bleb of 2% procaine is produced in the skin over the crico-thyroid membrane: only a few minims (6 to 12) of local anaesthetic are required, as more tends to cause haematoma formation. If cocaine is necessary some 5 minims of 5% cocaine hydrochloride is injected rapidly into the trachea, the needle being rapidly withdrawn. The patient sits up, coughs several times, then returns to exactly the same position as before. He is cautioned not to swallow or cough from this time until the radiographs have been seen and approved. The iodized oil—lipiodol (Lafay) or neohydriol (May and Baker)—is then injected through the anaesthetized area after heating it to just above blood heat in a water bath, the patient being rotated so that the opposite shoulder is raised several inches. This prevents the oil from running into the opposite main bronchus. After some 8 to 10 c.cm. has been injected the patient places his two hands on the investigator's shoulders, lifts himself to a sitting position, still leaning over to the affected side, and leans forwards and sideways so that his body is almost parallel with the floor. The investigator is now kneeling by the side of the couch, the patient's hands on his shoulders, the patient's face looking down into his. In this position 6 to 8 c.cm. of oil is run into the middle lobe. After 1 to 2 minutes the rest of the oil (6 to 8 c.cm.) is injected. The needle withdrawn, the patient quickly lies on the affected side, and the foot of the table is rapidly elevated. As his head sinks below his heels he moves half over on to his face, still lying on the affected side.

In this way the lung has been filled in all its zones, the bronchi of the "four fundamental lobes"—dorsal, middle, upper, and lower—being outlined on the affected side. If successfully done no oil has spilled over on to the opposite side and none has regurgitated into the mouth (though this cannot be prevented in all cases). Radiographs, A.-P. and lateral, are now taken. If the upper zone is mainly under suspicion the patient is kept in this position, with the head low, and radiographed. If the middle lobes are suspected particularly, the foot of the table is depressed so that the feet are a little lower than the head. A lateral picture is taken in this position, the patient lying on the affected side, and a P.-A. film with the patient on his face. If it is required to outline the basal bronchi particularly, lateral and A.-P. pictures are taken with the patient erect. In all cases he is kept in the same position until the films have been seen and passed, further views being taken as found necessary. Screening is then performed with the patient in the erect position. The opposite side of the chest is filled in the same manner some 7 to 10 days later.

One-stage Methods

If it is required to outline both sides at one session one of the following methods may be adopted.

1. Technique as above, using rather less oil; so that instead of a total of 20 to 25 c.cm. only some 14 c.cm. is introduced into the side under suspicion. Films are taken in the required position as described above. The remaining 8 to 12 c.cm. of oil is then introduced into the opposite lung with identical posturing, A.-P. and oblique views being taken. The disadvantage here lies in the reintroduction of the needle into the neck.

2. Technique as above, one side being completely filled and films taken A.-P. and lateral in the required position. If the patient has had the left side filled he turns on to the right, and the head of the couch is lowered for one or two minutes. The oil now runs from the left base into the right upper lobe bronchus. The couch is returned to its first horizontal position and the patient leans over the right side of the couch, with his body almost parallel with the floor, to fill the middle-lobe bronchus as described previously. In so doing some oil runs also into the lower-lobe bronchus. He then sits upright again, leaning slightly over to the right side, and more oil runs down into the basal bronchi. Screening is now performed, erect or prone, and if sufficient oil has not passed over into the second

side the posturing is repeated. It is necessary, however, to perform the whole manœuvre with as little delay as possible, as the oil becomes rather more viscid as it cools. Alternatively, the oil may be rendered thinner by the addition of olive oil (4 to 6 c.cm. of olive oil to 20 c.cm. of neohydriol or lipiodol), it being introduced without any preliminary heating. This, however, does not always give satisfactory results, as the thinner oil runs in the smaller bronchi and is there retained. By this posturing the patient is spared reintroduction of the needle into the neck, and excellent pictures can be obtained (Figs. 1 and 2)—A.-P. and lateral of the side first filled, A.-P. and oblique after filling of the second side.

Subsequently, whatever method is used, the patient is told to expectorate as much as possible and not to swallow any sputum. If necessary he should posture to get rid of iodized oil from any cavities where it may have lodged. Oil seen on screening in an iodine-sensitive patient's stomach should be removed by stomach wash-out or administration of emetics. A patient who has received cocaine should be warned not to eat or drink for three hours subsequently.

Discussion

The crico-thyroid route has been used merely because I get the best results with it, and because cocainization can be cut down to a minimum in all patients and omitted in many. Sensitivity below the vocal cords to injections seems to vary greatly, and many patients can control their cough reflex without cocaine anaesthetization (Jewesbury, 1939). Be that as it may, transnasal, translingual, or other routes may be used if preferred. The importance is stressed not of the site of introduction of the oil but of the areas reached after introduction. A lateral view of the affected side is essential, and, if posturing be faulty, oil on the opposite side will render this view confused, one bronchial tree being superimposed on the other in the film. To fill the middle lobe properly is also essential,

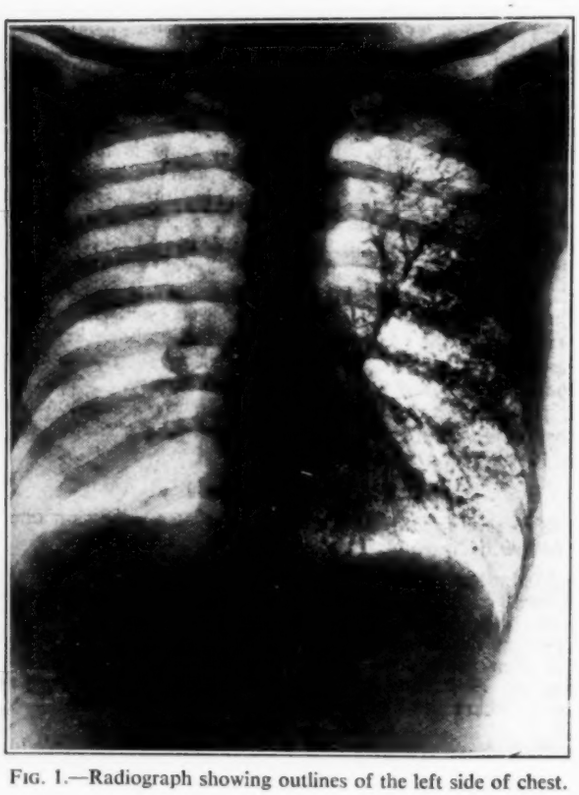

FIG. 1.—Radiograph showing outlines of the left side of chest.

and lateral views are again necessary. The hard-pressed radiologist should be spared the pain of reporting yet again: "Those few basal bronchi outlined are normal."

Summary

The importance of adequate posturing on bronchography is stressed, and a standard technique is described which allows delineation of all parts of the bronchial tree. Without such technique, imperfect filling of the bronchial tree will be the rule instead of the exception.

My thanks are due to Drs. W. E. Lloyd and W. H. Coldwell for their kindness and help, and to the Sister and staff of the *x*-ray department, Westminster Hospital.

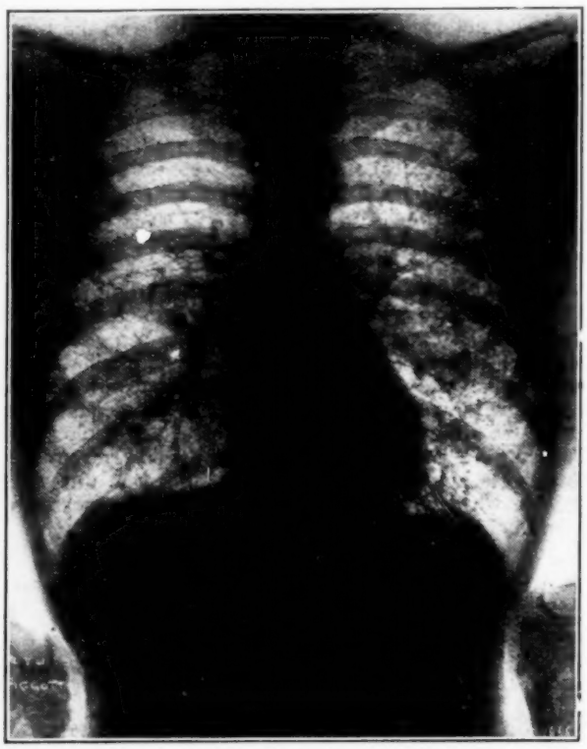

FIG. 2.—Right side outlined by posturing the patient. The oil from the left side has been made to run over and outline the right.

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THE EFFECT OF BLEEDING ON THE BLOOD-SUGAR LEVEL IN BLOOD DONORS*

BY

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AND

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The object of the present investigation was to determine whether the level of the blood sugar is related to the incidence of "fainting" in blood donors. The clinical characteristics of such faints have been previously described by Brown and McCormack (1942). Certain factors responsible have been analysed by a statistical survey (Greenbury, 1942). In the latter it was suggested that lack of food might be a predisposing cause. If a constant low blood-sugar level occurred in donors who fainted, as opposed to those who did not, it would favour such a hypothesis.

Method

In a series of 50 unselected donors blood-sugar estimations were made upon samples of capillary blood obtained from the ear immediately before and immediately after the withdrawal of between 400 and 450 c.cm. of blood by the Medical Research Council technique (Brown and McCormack, 1942). In a second series of 46 unselected donors blood-sugar estimations were made upon venous blood taken at the end of a routine bleeding from the antecubital vein. In these cases a pressure of between

* A report to the Medical Research Council from the N.W. London Blood Supply Depot.

60 and 80 mm. Hg had been maintained by a sphygmomanometer cuff on the arm for 3 to 5 minutes before the sample was obtained. During this period, in order to facilitate the blood flow, the donor had continuously clasped and unclasped a rolled bandage held in the palm of the hand. All samples were collected in small bottles containing dried oxalate (equivalent to 1 c.cm. of a mixture of 1.2% ammonium oxalate and 0.8% potassium oxalate). Owing to the nature of the transfusion service it was not possible to standardize conditions of temperature, previous exercise, or the time of the last meal. The majority of donors had had a meal within 3 hours of venesection.

The method used for the estimation of glucose was Harding's modification of the Schaffer-Hartmann method as described by King, Haslewood, and Delory (1937).

Results

In the series of 50 unselected donors examined before and after bleeding only 2 fainted. Their blood-sugar levels were 85.8 mg. and 98.6 mg. per 100 c.cm. before and 85.8 and 100.92 after bleeding. The findings in the other 48 donors are summarized in Table I. No change in blood-sugar level was found

TABLE I.—*Capillary Blood-sugar Values*

Time	No. of Donors	Blood-sugar Values in mg. per 100 c.cm.	
		Range	Mean
Before bleeding ..	48	60·32 to 100·40	94·91 ± 6·12
After bleeding ..	48	67·30 to 147·32	100·67 ± 6·56

in 13 instances ; in 27 there was a slight increase after bleeding, the average figure being 16.34 mg., while in 10 there was a decrease of the same order. In the second series of 46 unselected donors in whom the level of the blood sugar in venous blood obtained at the end of bleeding was determined, 16 fainted either while being bled, so that the full amount could not be withdrawn, or immediately afterwards. The results are summarized in Table II. Again the figures recorded reveal no

TABLE II.—*Venous Blood-sugar Values*

Donors	No. of Donors	Blood-sugar Values in mg. per 100 c.cm.	
		Range	Mean
Group 1 (normals)	30	28·01 to 106·42	66·14 ± 7·14
Group 2 (faints) ..	16	50·11 to 100·33	77·27 ± 5·90

significant difference in the blood-sugar level of donors who faint and those who do not.

There was no apparent relation between the age of the donor and the blood-sugar level. One extremely low figure of 28.01 mg. occurred in an old man of 73 who had had a good breakfast about 2½ hours before bleeding and who felt perfectly well. No correlation could be established between the time that had elapsed since the last meal, the blood-sugar level, and the incidence of fainting.

Discussion

The figures for the blood-sugar level recorded in the present investigation suggest that a low blood sugar is not a factor associated with fainting in blood donors, and that withdrawal of 500 c.cm. of blood does not result in any definite change in the blood-sugar level. The level in the first series, made upon capillary blood, was higher than that in the second series, made upon venous blood—a finding in agreement with that of other workers (Jonas, 1933 ; Himsworth, 1933 ; Shoji *et al.*, 1938). Shoji and his co-workers found that the contraction of the forearm muscles decreased the sugar content of venous blood considerably in non-fasting subjects. Such contraction of muscles occurs in all donors, as they are asked to clasp and unclasp their hands during the bleeding procedure in order to facilitate the blood flow. It is probably responsible for the rather wide difference observed.

Summary

The blood sugar was estimated in 96 donors, 18 of whom fainted. No significant difference was found in the level of the blood sugar after bleeding. This level was without effect upon the incidence of fainting.

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CONDITION OF RETAILED RAW MILK IN AN URBAN AREA

BY

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The incidence of tuberculosis of the bovine type in the human subject is regrettably high in this country. Bendixen *et al.* (1937) recorded aggregate figures which showed that the percentage frequency of this type in cervical gland infections at all ages was 46.2 and 52.3 in England and Scotland respectively. The corresponding figures in bone and joint infections were 22 and 29.8 ; in lung infections, 0.9 and 5.5 ; in lupus, 48.6 and 53.8 ; in meningeal infection, 25.7 and 29.8. Lesions due to the bovine type in the human subject result, in the majority of instances, from the ingestion of milk from infected cattle. It is difficult to obtain exact figures as to the incidence of infection in dairy cattle, but approximately 40% react to the tuberculin test and about the same proportion of cattle are found infected on slaughter in abattoirs. That raw milk should suffer as a result is a natural consequence. Thus Brownlie (1933) found that 10% of churn samples of retail milk in urban areas in Scotland contained tubercle bacilli.

Contamination of milk supplies by an organism such as the tubercle bacillus, whose virulence is capable of easy demonstration both in the experimental animal and in the unfortunate human patient, rightly has greater claim to attention than the general cleanliness of the milk, by which term is meant freedom from bacterial contamination, irrespective of the type of organism present. Nevertheless, questions of both economic and public health importance depend upon this latter quality.

The following data were recorded as the result of an investigation into the raw milk supplies of an urban community in which it was estimated that 50% of retailed milk was of this type.

Methods

A sample of milk measuring 300 c.cm. was taken into a sterile container from the raw milk exposed for sale in the retailer's premises on the morning of delivery and brought immediately to the laboratory for examination. Three tests for cleanliness were then applied. Two of these were the plate-count and presumptive *B. coli* tests, recommended in the Milk Special Designations Order, 1936, Scotland. The third test was the methylene-blue reductase test, introduced under the Milk Order, 1936, England and Wales, as a substitute for the plate-count test. In addition, many of the milks were examined for the presence of tubercle bacilli. The methods used are, in brief, as follows:

1. *Plate-count Test.*—Decimal dilutions of milk in 90 c.cm. of diluent were prepared. From the 1/100 and 1/1000 dilutions three separate 1-c.cm. volumes were plated in Wilson's (1935) yeastrel agar medium. After incubation at 37° C. for 48 hours colonies were counted by means of a hand lens and tally counter.

2. *Presumptive B. coli Test.*—Three tubes of MacConkey's fluid medium were each inoculated with 1 c.cm. from the 1/1000 dilution of milk. The presence of acid and gas after 48 hours' incubation at 37° C. was noted.

The standard upon which the quality of samples was judged by the above tests was that demanded of standard milk by the

Scottish Order, 1936—i.e., fewer than 200,000 viable bacteria per c.cm. and no *B. coli* in 0.01 c.cm.

3. *Methylene-blue Reductase Test.*—The modified test described Wilson (1935) was adopted. To 10 c.cm. of milk in a standard sterile test-tube, 1 c.cm. of methylene-blue solution was added. The tube was fitted with a rubber bung, placed in a water bath at 37° C., and inverted at intervals of 30 minutes.

The standard upon which the quality of the milk was judged was that demanded of "accredited milk" under the English Order, 1936—i.e., the milk must not decolorize methylene-blue within 4½ hours if the sample is taken at any time from May 31 to Oct. 31; or within 5½ hours if taken at any time from Nov. 1 to April 30.

4. *Examination for Tubercle Bacilli.*—100 c.cm. of each sample was centrifuged for 30 minutes at 3,000 r.p.m. The resulting deposit was then resuspended in 5 c.cm. of the supernatant fluid, and the entire bulk injected without further treatment into the inguinal region of a guinea-pig. Eight weeks later, if not already dead, the animal was killed. The macroscopic appearances of any tuberculous lesions present were confirmed by the examination of stained films. All animals were kept in separate cages, and in no instance were lesions of tuberculosis noted other than those resulting from the injection of the milk samples.

Results

Examination for Gross Bacterial Contamination.—The completed examinations by all three tests for cleanliness are summarized in Table I. It will be seen that, irrespective of the test

TABLE I.—*Examination of 116 Samples of Retailed Raw Milk by Various Tests for Cleanliness*

Test	Result	
	Passed	Failed
37° C. plate-count	61 (53%)	55 (47%)
Presumptive B. coli	55 (47%)	61 (53%)
Methylene-blue reductase	61 (53%)	55 (47%)

used, approximately half the specimens failed to reach the desired standard. The highest proportion of failures—namely 53%—was obtained by means of the presumptive *B. coli* test, which was included as an indication of excretal contamination. Of the 116 specimens examined, 60 were taken during the winter months and 56 in the following summer period. The influence of climatic factors on the condition of the retailed milk is indicated in Table II. Thus during the colder period the

TABLE II.—*Comparative Results of Tests for Cleanliness in 60 Winter and 56 Summer Samples of Retailed Raw Milk*

	Winter Samples	Summer Samples
1. Failing 37° C. plate-count test ..	12 (20%)	43 (76%)
2. ,, presumptive B. coli test ..	17 (28%)	44 (78%)
3. ,, methylene-blue reductase test ..	18 (30%)	37 (66%)

percentages of failures in the plate-count, presumptive *B. coli*, and reductase tests were 20, 28, and 30 respectively. In the summer period these figures rose to 76, 78, and 66. The quality of raw milk could not be correlated with the amount handled by individual retailers.

Examination for Tubercle Bacilli.—In all, 93 of the specimens of raw milk were also examined for the presence of tubercle bacilli, and 19 (20%) were found positive. For interest, it may be noted that 5 of the positive specimens passed all three tests for general cleanliness, 11 failed all three tests, while the remaining 4 failed in one or more test. During the investigation 16 retail shops were visited.

Commentary

These results serve to indicate the continued unsatisfactory condition of raw milk supplies. The proportion of retailed milk of this class varies greatly in different centres, but in the larger towns and cities the tendency is towards a gradual reduction. Nevertheless the untreated product is still widely used in rural areas and in smaller townships. As Griffith and Smith (1935) have shown, it is in such areas that the incidence of bovine tuberculosis is highest. Little comment is necessary in regard to the demonstration of tubercle bacilli in one of every five specimens in the series examined, save to mention a popular quasi-scientific criticism that pasteurization, resulting in the destruction of any tubercle bacilli present, may remove the stimulus to an acquired immunity. Apart from the absence of any satisfactory scientific demonstration of this possibility, one may quote Bendixen *et al.* (1937), who ask, in referring to the fact that in 1931 about 2,600 persons died from tuberculosis of bovine origin in Great Britain, "What other method of vaccination would be tolerated that exacted such a sacrifice?"

The gross bacterial contamination found in so many of the specimens beyond the limits recognized for the lowest grade of milk under the Milk Orders, 1936, also requires serious consideration. The question at once arises, To what extent has legislation influenced methods of production and distribution? No doubt much has been accomplished by these means, but there is still room for vast improvement. In fact, it must be considered whether the situation can be met only by the immediate institution of compulsory pasteurization. For a reasoned summary of the possible effect of the adoption of this measure the report by Bendixen *et al.* should be consulted. In this report the advantages of efficient pasteurization are adjudged to outweigh any possible disadvantages. A further criticism has been that pasteurization may result in the loss of certain growth-promoting properties of raw milk. Wilson, Minett, and Carling (1937) in a controlled experimental study found nothing to suggest that, for calves, the nutritive value of holder-pasteurized milk was in any way inferior to that of the raw product.

Conclusions

Of 116 specimens of retailed raw milk, the percentage failing the standard plate-count, presumptive *B. coli*, and methylene-blue reductase tests were 47, 53, and 47 respectively; during the summer months the corresponding percentages rose to 76, 78, and 66, respectively.

20% of these specimens contained virulent tubercle bacilli.

Compulsory pasteurization of milk is considered an essential measure.

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Medical Memoranda

Obstructed Labour due to Conjoined Twins

The following case report may be considered interesting enough to warrant publication.

CASE HISTORY

A primigravida aged 25 was admitted to hospital at 5.15 a.m. on Sept. 8, 1941, as an emergency case. The history was that of a normal pregnancy, with an estimated duration of approximately 38 to 39 weeks. Her general health was good. Onset of labour occurred at 2 p.m. on Sept. 6 with slight pains; spontaneous rupture of the membranes took place at 6 p.m. on the 7th. Two vaginal examinations were made at the patient's home by the midwife, the second one at time of rupture of the membranes. The doctor called in on account of delay in the second stage ordered the patient into hospital with a provisional diagnosis of persistent occipito-posterior position.

On admission to hospital her general condition was good, and the blood pressure 128/84. She was a healthy-looking woman of rather robust build. The uterus corresponded in size to that of a normal full-term single pregnancy. Pains were strong and very frequent, and the caput was well visible during pains. The foetal heart was regular: rate 132 per minute.

Progress after Admission and Manner of Delivery.—In view of the normal size of the uterus and also (apparently) of the head distending the perineum, the possibility of twins was not at first considered. Preparations were immediately made for conducting delivery, which seemed to be about to occur forthwith. One hour after admission, however, the woman was still undelivered, in spite of the fact that the head appeared almost

"crowned" during pains. The pains were now very strong, and came on in rapid succession. The foetal heart could be auscultated only with difficulty, but was evidently becoming slower. At this stage the perineum was infiltrated with local anaesthetic and an episiotomy was performed. No further advance resulting from this, Wrigley's short forceps were slipped on and the head delivered (in the occipito-anterior position). The head did not, however, come down fully, and the chin was freed with difficulty. The appearance was as if something were pulling the head back again into the vagina. There was no sign of respiration. By employing head traction and pressure on the fundus the arms were eventually and with great difficulty delivered. The trunk had not advanced during this manœuvre, and, the head and shoulders being born, it was clear that some uncommon cause of obstruction must be present. The uterine contractions by this time were becoming dangerously tetanic, so that a speedy delivery was imperative.

General anaesthesia having been started, a hand was passed into the vagina to determine the cause of the obstruction. Foetal limbs were felt in the region of the pelvic brim, tightly gripped by the lower uterine segment. Amyl nitrate was administered—effecting a slight degree of relaxation—but attempts to deliver the trunk again proved unsuccessful. The thorax was now opened and eviscerated. Exploration being thus rendered less difficult, the presence of twins was established by the discovery of a third arm. A little later it was realized that some kind of double monster must be present, as foetal parts could be palpated without a break in continuity from the arm of the second twin on to the trunk of the first. After this, delivery of what proved to be a double monster of the thoracopagous type was effected in a few seconds. The third arm, mentioned above, was pulled down, and after it the fourth, then all four legs in succession. Traction on the legs brought out the buttocks, and lastly came the trunk, shoulders, and head of the second half of the monster.

The third stage was completed in a normal manner. The uterus was well contracted afterwards, and the general condition of the mother was good. The puerperium was quite normal, and the patient was discharged home on the 12th day.

The Specimen.—The two halves of the thoracopagus were approximately equal in size, each having a normally developed head and limbs (see accompanying photographs). They were joined face to face, by soft tissues only, down the front of chest

FIG. 1

FIG. 2

and upper abdomen. The placenta was single, and there was a large common exomphalos, into which ran the single umbilical cord and inside which coils of intestine were visible. The monster weighed 8 lb. 7 oz., and the length of each half was approximately 19 in.

COMMENTARY

Delivery was not difficult after crushing of the thorax of the first twin had allowed adequate access for exploration and diagnosis. Had the monster been larger it would doubtless have needed dividing into its two halves to make delivery possible. The ventral connecting portion, being of soft tissues only, was lax enough to permit some movement of one twin relative to the other. At one point during the manipulations the two heads were stretched out so as to constitute the opposite extremities of the monster, with the two trunks and all the limbs between them.

In this connexion the following description from Whitridge Williams's *Obstetrics* may be quoted: "Thoracopagi are frequently so loosely connected with one another that considerable motility is possible. Indeed, it is not unusual for the two children to present in a different manner. When possible, it is advisable to bring down all four feet at the same time and to effect extraction in such a way that the posterior head is first delivered. In cephalic presentations the head and body of the first child is expelled and the second child is then born very much as in an ordinary twin pregnancy. If, however, the latter presents transversely, its delivery can be effected only by version and extraction."

I am indebted to Dr. James Clark, medical superintendent, and Dr. W. J. Clancy, senior obstetrician, for permission to publish this case.

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A Case of Polyradiculoneuritis

The following case seems to be interesting enough to merit publication.

CASE REPORT

The patient, a ham-curer aged 50, was admitted to the Victoria Infirmary, Glasgow, on Sept. 1, 1941, suffering from symptoms of polyneuritis which conformed very closely to the syndrome first described by Guillain, Barré, and Strohl (1916). The symptoms also closely resembled those described by H. Stuart Barber (1940).

For some weeks before the onset of paralysis he had felt pain in the lumbar region. This was not very severe but was constant, and his doctor had given him some medicine for it. For a few days previous to the paralysis his urine was highly coloured; he described it as being "red." On Aug. 25 he had gone to work and had done his job as usual. The next morning he could not stand. He had no other complaints, apart from the slight pain in his back. He became very restless during that day, and did not sleep on the following night, an irritation of the skin causing him to scratch himself to the point of drawing blood. On Aug. 27 he had palsy of the left side of the face and some twitching of the muscles of the right side of the face.

On admission there was double facial palsy, with inability to close his eyes, definite muscular weakness of both arms, and complete paralysis of both legs. The biceps and triceps reflexes were weak. Abdominal reflexes, knee-jerks, and ankle-jerks were absent. There was no loss of sensation either to superficial or deep tactile stimuli or to pain. Pronounced nuchal rigidity and Kernig's sign were present. Sleeplessness was a marked feature of the acute stage of his illness, but headache was not complained of. The temperature was normal; there was some tachycardia, the pulse rate being about 100 during his first week in hospital, later falling to 80. The urine was normal and contained no blood. Lumbar puncture revealed a normal fluid pressure. The cell count was 4 per c.mm.; protein, 122 mg. per 100 ml.; chlorides, 733 mg. NaCl per 100 ml.; sugar, 84 mg. per 100 ml. The blood leucocyte count was 19,300 per c.mm.; the sedimentation rate was not estimated; the Wassermann reaction was negative.

Dr. Conway, ophthalmic surgeon to the hospital, reported on Sept. 4 that the edges of the left optic disk were blurred, but that the condition was short of true swelling of the disk. The right optic disk was well defined but showed definite nasal pallor. There was no paralysis of the external muscles of the eye.

The patient's condition became worse for a few days after admission, and he was incontinent of urine on several occasions. After a week improvement was noticed and he was able to move the legs slightly. The improvement continued without interruption, and eight weeks after the onset recovery was almost complete, except for slight paresis on the left side of the face, and he was able to walk with assistance. The knee-jerks and ankle-jerks were still absent.

Comment.—The features of this case are: the sudden onset of paralysis affecting the legs, arms, and facial muscles, distribution being symmetrical; the comparatively rapid and complete recovery; the normal temperature throughout; the tachycardia; and the cerebrospinal fluid under normal pressure, with normal cell count but high protein content. These features are so similar to those described by H. Stuart Barber and others as to suggest that a specific virus might be the cause of this condition.

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Reviews

PSYCHOTHERAPY

The Therapy of the Neuroses and Psychoses. By Samuel Henry Kraines, M.D. (Pp. 512. 25s.) London: Henry Kimpton. 1941.

This book has the merit of concentrating on what most books tend to put into a secondary place—namely, treatment—and for this reason it should appeal especially to the practitioner and the student. The accounts of treatment with which it is mainly concerned are such as might, with a reasonable amount of time at his disposal, be used by the family doctor. The author's chief methods might even be described as those of common sense.

For a variety of reasons psychotherapy has tended to depart in recent years from the obvious. Much has been hoped for from psycho-analytic methods, and a good deal if not all that has been hoped has been fulfilled. To the uninitiated there is a promise in psycho-analytic methods of something like magic in the removal of symptoms by a performance akin to a surgical operation, with the minimum onus on the patient, and perhaps not demanding much more of the doctor than a capacity for sustained attention and some intellectual dexterity. They have the appearance of taking responsibility away from the patient and leaving the cure to the efforts of the doctor, or at any rate to Nature, with the doctor acting as a kind of psychological midwife. But the unique success of the Freudian method in certain cases, as well as the vast panorama of psycho-analytic observation and theory generally, has caused the influence of factors other than complexes and the like in producing breakdown to go out of fashion. The effects of pernicious upbringing, of misguided types of education for life, and of the accumulation of faulty habits are unsensational, but they are probably more often the cause of psychoneurotic illness than is nowadays suspected.

Dr. Kraines undertakes the task of treating his patients from this point of view, and seeks to retrain them in their habits and attitudes by teaching them to observe themselves, to control their more selfish or more primitive impulses, to adopt a rational rather than an emotional attitude, and to reorganize their lives in the light of an analysis of their character and behaviour. Conscious rather than unconscious factors are stressed throughout, although there is a purely descriptive chapter on Freudian theory appearing rather uneasily at the end of the book. Emphasis is laid on the need for control rather than on emancipation through recapitulation and catharsis. It is true that some of the advice seems very obvious, almost distressingly so in the section headed, "Therapy of Stress by Removal: Financial Assistance the Best Therapy, especially in the Case of Actual Want." How often has even the novice had this glimpse!

LEUKAEMIA IN ANIMALS

Spontaneous and Experimental Leukaemia in Animals. By Julius Engelbreth-Holm, M.D. (Pp. 245; illustrated. 15s.) Edinburgh and London: Oliver and Boyd. 1942.

The monograph on *Spontaneous and Experimental Leukaemia in Animals* by Engelbreth-Holm has been written at the request of the scientific advisory committee of the Lady Tata Memorial Trust and is published under the Trust's authority. The translator and the scientific committee are to be congratulated on the lucid style of the English, while the Trust and the publishers are to be congratulated on the production of so well-printed and well-illustrated a book at so reasonable a price. Its appearance at the present time is peculiarly appropriate because in more senses than one it marks the end of a period. It summarizes research which had gained a fresh impetus since the inception of the Trust's work in 1932, and it is characteristic of the truly international outlook of the Trustees that the book should have been written by a Dane and produced in England with the support of a Trust founded by an Indian. That international outlook is for the moment obscured, but when it clears again this monograph will serve as an indispensable guide for the resumption of research on the leukaemias. It describes the occurrence and morbid appearances of leukaemia in a great number of birds and mammals. It is not generally known that leukaemia occurs with sufficient frequency in fowls and cattle to constitute at times a serious economic problem. Transmission experiments have shown that certain varieties of fowl leukaemia can be transmitted by a virus, and there is suggestive evidence that one and the same virus may under different conditions produce leukaemia or sarcoma. In mammals leukaemia can be transmitted only by transplantation of cells, but in the mouse pure strains can be bred in which the incidence of spontaneous leukaemia is 90%. Leukaemia may also be initiated by carcinogenic agents. Thus the same factors are of importance in leukaemia as in neoplasia—virus, heredity, and chronic irritation. It is probable that research on leukaemia would have taken a more chemical trend under the stimulus of recent work on the chemistry of the viruses and the genes. For this we may now have to wait till after the war, but veterinarians, haematologists, and experimental pathologists will be permanently indebted to Engelbreth-Holm for his able record of the progress to date.

TREATMENT OF SHOCK

The Treatment of Shock. By R. W. Raven, Major, R.A.M.C. Oxford War Manuals. (Pp. 96. 5s.) London: Oxford University Press. 1942.

Shock in its various forms is a central problem of war medicine and surgery. The intense interest of practical surgeons and the zealous investigations of research workers in all branches of medical science have done much to advance our knowledge of this complex subject, both in the last and in the present war. It is eminently desirable that accurate and up-to-date information be made readily available to medical men serving on our various war fronts. Had this manual fulfilled these requirements it was assured of a warm welcome. Unfortunately these hopes are disappointed.

Following a satisfactory introductory chapter in which Blalock's excellent classification of shock into neurogenic, haematogenic, vasogenic, and cardiogenic is quoted, the author lapses into the old unsatisfactory subdivision of primary and secondary varieties. The clinical description of shock is poor—e.g., the mental state is described as follows (p. 14): "There is apathy, stupor, delirium, and unconsciousness." Many incomprehensible statements occur such as, "Excessive preoperative medication, especially in aged patients, may precipitate a condition of shock from which there may be no recovery" (p. 8). Misstatements are frequent even on important and crucial matters. To say that losses of 4.5 or 5.1% of the total blood volume cause death (p. 20) is obviously incorrect, and even Keith's finding that the patient's condition was grave when blood volume was reduced to 85% (p. 22) has been completely upset by recent work: Wallace and Schafer showed that blood loss in man of 1,200 c.cm. (25% of the total blood volume) was well tolerated. Brennan's claim that plasma transfusion washes side-tracked corpuscles into circulation again is accepted uncritically. The section on oxygen therapy is confused by failure to comprehend the underlying physiological principles. Haemoconcentration, which only occurs in burns and crush injuries, is given undue prominence in discussion. Even the available case reports of the last war show that haemoconcentration rarely occurs in the shocked patient.

The technical details of transfusion are adequately described, and there is a good bibliography.

BORSTAL THROUGH AMERICAN EYES

Criminal Youth and the Borstal System. By William Healy, M.D., and Benedict S. Alper. (Pp. 251. 8s. 6d. net.) New York: The Commonwealth Fund; London: Oxford University Press. 1941.

It takes a foreigner to appreciate our institutions to the full, and one of the best existing books on the Borstal system has now been written by two Americans, both with long experience of practical criminology. It seems that the methods used in the United States for dealing with youthful offenders leave a good deal to be desired. Although in theory reformatory treatment is provided for younger criminals, American reformatories are only prisons under another name, and the system has shown no appreciable success. Dr. Healy was convinced of the value of the Borstal system by an observation of it which he made in 1929. In 1938 he made a second study for the American Law Institute, and the war cut short a third intensive study financed by Mr. J. D. Rockefeller, in which Mr. Alper took part. The authors are therefore well qualified to write

on the work of the Borstal institutions. They trace the history of the system from its inception in a wing of Bedford Prison, through its establishment as a recognized part of the penal system after the passing of the Prevention of Crime Act in 1908, to the latest developments, a few years before the war, of North Sea Camp and Prescoed. They summarize the law and practice which govern committal to Borstal, and the system of allocation, and they go on to describe the general principles of the training, and especially its flexibility, so that the length of time each offender shall spend in an institution and that which he shall spend on licence to the Borstal Association are made to correspond with his individual requirements.

The house system, the steady balanced life, and the personal relationship, with the other essentials of this valuable discipline, are appreciated in detail. A chapter describes the recruitment of the staff from men of very varied types, having in common initiative, strength of character, and experience of life. Staff-inmate relationships, the training programme, and home and community relationships are studied in equally precise detail, and the special features of the different institutions are described. The authors' remarks on weaknesses in the system are worth special attention, and the first which they indicate is the absence of any consistent attempt to apply psychological knowledge to the treatment of abnormal personalities. They also criticize gravely the existence of a legal maximum period of four years after which an offender may not be held. While they do not advocate a completely indeterminate sentence, they agree with those governors who would have, for some youths, a longer time in an institution and a much longer time on parole. Their final chapter on the possible application of the system to American needs is rather for their own countrymen, but their masterly analysis will greatly assist English penologists and, no doubt, reformers in other countries.

Notes on Books

Prof. A. MUIR CRAWFORD of Glasgow has now produced a fifth edition of his little book *Materia Medica for Nurses* (H. K. Lewis, 4s. 6d.). Many changes have been made in the text, and the scope of the work has been enlarged to include descriptions of some of the newer drugs. There are additional chapters—one on the sulphonamide group and one on the Dangerous Drugs Acts and the Pharmacy and Poisons Act.

An illustrated pamphlet entitled *Some Emergency Anti-Malarial Measures*, by Sir MALCOLM WATSON, director of the Ross Institute of Tropical Hygiene, has been issued by its industrial advisory committee. Copies may be obtained on application to the organizing secretary of the Ross Institute, Keppel Street, London, W.C.1.

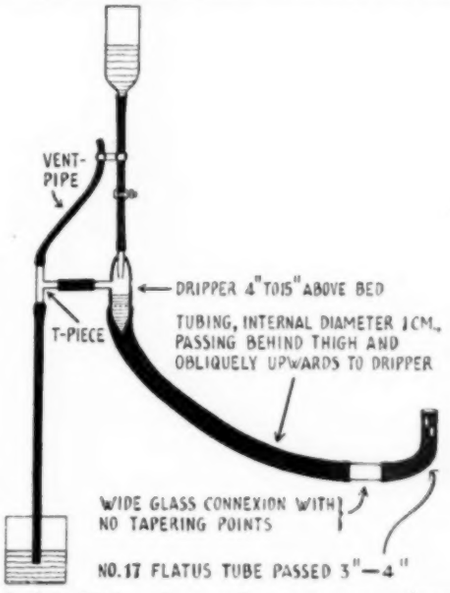
Preparations and Appliances

RECTAL ADMINISTRATION OF FLUID

Mr. D. C. CORRY, M.D., F.R.C.S., Surgeon to the Radcliffe Infirmary, Oxford, writes:

After the mouth the rectum is the most physiological route for giving fluid. J. B. Murphy (1909) was the great advocate of this method, and reported that he very often gave 15 pints of fluid a day by this route. The points he stressed were: (1) that the tube in the rectum must be large enough for flatus to be passed; (2) that the column of fluid must not be higher than 4 to 15 inches; (3) that the tube to the reservoir must have an internal diameter of at least 3/8 in. (1 cm.); (4) that the fluid be given intermittently. He achieved this originally by a flat pan reservoir, and into this flatus and faeces were regurgitated.

For the last year I have been giving rectal fluids, using the same principles but utilizing a dripper with a side arm. By this method 2 to 8 pints can be given in 24 hours. Even if the patient takes only 2 pints this is a useful addition to his body fluids, and is an improvement on the cases we used to meet of which we were told, "He will not retain any rectal fluids." The side arm on the dripper allows flatus and fluid to escape, so that the patient is comfortable with the tube in the rectum. A glass T-piece is attached with one branch going upwards. This serves two purposes: it prevents a siphon effect from developing when the fluid from the dripper escapes out of the side arm, and acts as a vent-pipe for the flatus. A foot of rubber tubing is fitted to this upper limb of the T-piece and is strapped to the adjacent tube. This prevents the ejection of faecal fluid from the top of the tube. The lower end of the T-piece goes into a receiver. A flatus-tube (No. 17 English catheter gauge) with end and side openings is used in the rectum. This is joined by a wide-bore glass connexion with 2 ft. 6 in. of wide-bore tubing the internal diameter of which is 1 cm. This is connected to the dripper, which must not have too tapering a lower end. With a wide-bore tube and wide-bore connexion, flatus can escape freely back and the patient is comfortable. The height of the dripper


VENT-PIPE
DRIPPER 4"TO15" ABOVE BED
T-PIECE
TUBING, INTERNAL DIAMETER 1CM., PASSING BEHIND THIGH AND OBLIQUELY UPWARDS TO DRIPPER
WIDE GLASS CONNEXION WITH NO TAPERING POINTS
NO.17 FLATUS TUBE PASSED 3"—4"

above the bed is 10 in. It may be necessary to increase the height to 15 in. For acute appendicitis, when it is thought desirable to give fluid, I limit the height to 8 in. out of respect for the appendix stump. Before inserting the flatus-tube, fill the tubing below the dripper with fluid and then pass the flatus-tube below the thigh and 3 in. to 4 in. into the rectum. Strap the flatus-tube to both buttocks.

For rectal drip, usually tap-water and 5% glucose is used as a routine post-operatively in any major case. I normally limit the fluid intake to 6 pints a day. On return from the theatre, while semi-conscious, the patient will tolerate rectal fluid given by any method better than when conscious. The drip is therefore started at a rate of 80 drips a minute (half a pint an hour) and slowed down to 40 drips after two hours. When the apparatus works unsatisfactorily it is usually due to air-locking, which may occur in spite of the tube to the dripper being 1 cm. in diameter. Pressing the tube where it passes under the thigh may expel the bubble. If this fails, take out the rectal tube, allow fluid to run through till the tube fills, and re-insert.

Apart from abdominal cases, it is useful in genito-urinary cases, especially after prostatectomy, in which it is desirable to keep the kidneys functioning adequately. In subtotal thyroidectomies it may help to lessen thyroid crises, as glucose and water are sometimes employed to treat these crises when they occur. It certainly helps to make these patients comfortable after thyroidectomy, saving the trouble of reaching out for frequent small drinks, which on account of the neck operation are painful to swallow.

In addition to making the patient so much more comfortable and fit the next day, I consider it is possible that by the use of the rectal drip (plus sulphanilamide in infected cases) the incidence of pulmonary embolism may be lessened.

I wish to thank my house-surgeon, Mr. Peter Henderson, and Sister T. M. King for their help in the application of the apparatus.

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DOES HEALTH EDUCATION HELP?

Never perhaps has this country become so conscious of its health as in the months that have passed since September, 1939. A sick person means an inactive person, and the output of work of a man whose health is below par falls below that of which he is fully capable. After the fall of France we were brought face to face with the fact that this country was small and, compared with Germany and her satellites, numerically inferior in population. Each man and woman counted, and numerous agencies were set to work to keep the health of the country at as high a level as possible. In this the Ministry of Food has come out with flying colours, and its imaginative as well as its realistic handling of an activity that is more important than any other in maintaining and promoting health will, when the balance sheet comes to be added up after the war is over, be found to be very much to its credit. Food propaganda—instruction in food values and in cooking—is one aspect of health education. And the success of this is partly an answer to those who doubt the value of such education. Dr. Donald B. Armstrong, Vice-President of the Metropolitan Life Assurance Company of New York, observes[1] that in the U.S.A. "there are still those in public health who see little or no value or scope in health education." And what is true of the U.S.A. is probably true here. It is indeed a matter in which it is easy to lose perspective, and to attribute to health teaching, say, the decrease in droplet infection and the increase in immunization against diphtheria, and the decrease in respiratory tuberculosis to the control of arbitrary spitting.

Those who believe in the value of health education have been encouraged by the experience of the Metropolitan Life Assurance Company of New York, and it is this which makes Dr. Armstrong's observations of particular interest and value. His company has for years carried out an extensive health programme among its industrial policy-holders. It has employed every medium of propaganda, and those in this country who see the American weekly magazine *Time* have probably noticed with interest the advertisements of the Metropolitan Company in relation to health matters. The company has, of course, been able to follow up its general programme with the special educational efforts of its agents, who come into contact with the individual person in the home. That a large business concern should undertake such a wide measure of public health education is an interesting commentary on the times in which we live. The company itself would probably be the last to claim that it did this work from philanthropic motives or from the reaction of an acute social conscience. It started, and has continued, the work because it pays. Since 1911 the policy-holder group is estimated to have gained about 17 years in life expectation, as compared with about 10 years for the country's population in general. It has been calculated that in 1939 alone the lives saved were approximately 112,000 in excess of those that would have been saved if the policy-holders had experienced only the benefits shared by the general population of the country since 1911. Closer analysis shows that since 1911 there has been a 92% improvement in diphtheria mortality among the general population of the U.S.A., and a 95% improvement in the industrial-policy-holder group—a 3% gain. In pneumonia there has been a 7% gain, in tuberculosis a 10% gain, in puerperal diseases a 17% gain.

Both groups have shared the influences that have led to the general improvement in health. The insured group has been subjected to an intensive health education campaign. The matter is slightly complicated among this group by the facts that the Metropolitan Life Assurance Company provides a nursing service for its acutely ill policy-holders, and that in this nursing service special attention has been paid to diseases of the puerperal state and to communicable diseases such as diphtheria and pneumonia. So in attributing to health education any improvement in health and expectation of life among policy-holders this nursing factor is one that must obviously be taken into account. Dr. Armstrong believes that a more sensitive index of the value of health propaganda is afforded by the attack his company made upon the problem of appendicitis in 1934. The campaign was aimed at preventing unnecessary fatalities from this disease, and was carried out by means of pamphlets and articles, advertisements, posters, lectures, and news releases. During this period appendicitis mortality improved by more than 30%. This coincided with an improvement of 24% in the general population. During this period there were no important advances in the diagnosis or treatment of appendicitis, with the one exception of the quite recent use of sulphonamide drugs in the treatment of peritonitis resulting from perforation. It would, in fact, seem reasonable to attribute the improvement obtained to health education.

But Dr. Armstrong, from his wide and unique experience, utters what is in effect a warning to health educators—namely, that they should not take themselves too seriously. At the moment attention is being focused on the results of examining large numbers of entrants to the fighting Forces in the U.S.A., and enthusiastic health educators are anxiously wondering whether the results will reflect upon the efficiency of the teaching for which they have been responsible. Dr. Armstrong suggests that health education is not the only or the most important factor in any rise or fall in the rejection of recruits. In the first place the experience of the last war and the advances in medicine made since have led to an altered conception of what we mean by fitness and of the medical standards of entry into the Services. Then again, there have been big advances in diagnostic equipment, in hospital services, in treatment, in knowledge of normal standards of nutrition, and changes in such fundamental matters as standards of housing and living. Health instruction for the public at large has not been without effect upon the doctor himself. Dr. Armstrong in fact states unequivocally that some doctors first heard of the Schick test through "lay contacts or through the perusal of literature primarily intended for lay consumption." Some efforts have, in his view, been misdirected, and he cites the fanatical outburst of toothbrushing that went on 20 years ago, when "whole schools and squads of children were mobilized in playgrounds and elsewhere and exposed to toothbrush drills, thus overemphasizing this already exaggerated point." Parenthetically he observes that if the time and money that had been spent on this one aspect of health teaching had been devoted, for example, to research on the relation of dental caries to nutrition or to heredity, something more constructive might have emerged. Since then the toothbrush has been blamed for injuring gums and eroding teeth, and health educators perhaps had better be warned now not to swing over in the opposite direction of recommending no toothbrush at all.

[1] *J. Amer. med. Ass.*, 1941, **117**, 2060.

As a further corrective to an unbalanced attitude towards the virtues of health education, Dr. Armstrong describes the experience of Canada and the U.S.A. last year, when an "influenzal pneumonia outbreak" spread across those two countries from west to east. In most parts of both countries, in spite of an increase of influenza and its accompanying pneumonia, the death rate from the latter as compared with 1940 actually fell, but in Quebec there was a sharp rise in the mortality from pneumonia; this, he believes, was due to the fact that medical practice and public health procedures are backward there in comparison with other areas. The interesting point is that the Metropolitan Life Assurance Company insures a larger percentage of the population in Quebec Province than elsewhere, and it has there also concentrated on health teaching to the extent even of "preparing health education material in the native language." In an attempt to find the significance of health education in relation to the numerous medical, nursing, public health, and sanitary agencies, Dr. Armstrong likens it to an enzyme the function of which is to accelerate changes in a certain direction.

We believe that on the whole this country has been backward in enlightening the public in health matters, and also that in the future such teaching should play an important part in the new Britain which reformers do not altogether despair of seeing. But those who enter into this work must get the part they play in it into the right perspective. It is, for example, no good recommending what a well-known Hyde Park orator used to recommend every Sunday to an admiring audience—namely, duck and green peas three times a day—(1) if these delightful commodities are not available, (2) if people have not the money to buy them, and (3) if in practice one can have too much of a good thing. The health educator, in fact, must always be aware of the limits imposed on his work by social factors beyond his immediate control. His efforts may, too, be hindered by inefficient or inadequate medical services, or by a medical profession apathetic because of an educational system that still lays too great stress on the end-products of disease—morbid anatomy and morbid histology. But given every desideratum, there still remains one pernicious influence which will always work against health education, and that is the morbid interest in disease which is kept alive and inflamed by the advertisements of patent medicines.

FURTHER LIGHT ON HYPERTENSION

Goldblatt and his co-workers[1] showed that in experimental animals the artificial production of renal ischaemia by constriction of the renal arteries led to persistent hypertension. If the constriction was severe enough there was a clinical picture of malignant hypertension, and widespread pathological changes were found in the arterioles. The kidneys themselves, however, escaped this change, as they were the only organs in which the effects of the hypertension were not felt owing to the experimental conditions under which it was brought about. Wilson and Byrom[2] followed up Goldblatt's work and showed that in some animals, especially the rat, severe malignant hypertension could be produced by constriction of the renal artery on one side only, and in such cases the pathological changes were found not only throughout the body, but also in the kidney the blood supply of which had not been reduced. In some further work these same authors[3] describe the "vicious circle" in chronic Bright's disease—that is, hypertension caused by renal ischaemia leads to further changes in the blood vessels of the kidney itself, which in turn increase the ischaemia and therefore the degree of hypertension. When one renal artery is partially occluded by a clamp and hypertension thus brought about, removal of the clamped kidney causes a return of the blood pressure to normal in a proportion of the cases only. Where the hypertension has persisted after removal of the clamped kidney, vascular changes have always been found in the opposite kidney. Finally, evidence shows that the residual hypertension may itself give rise to further lesions in the remaining kidney, and so progressive renal destruction takes place.

The clinical implication of these experiments is that malignant hypertension in man may be looked upon as a syndrome which may result from any pathological condition of the kidney giving rise to ischaemia. This explains why in patients suffering from benign hypertension, chronic nephritis, or chronic pyelonephritis there may be a sudden aggravation of their hypertensive state with retinal changes and deterioration of renal efficiency. The same malignant termination may be seen in cases starting as toxaemia of pregnancy or as lead poisoning. This conception also explains the histological finding of acute fibrinoid necroses of arterioles and glomeruli superimposed upon a variety of more chronic renal lesions. Malignant hypertension with typical renal changes may also occur as a terminal stage in pituitary basophilism, in which the primary hypertension is probably not of renal origin at all.

A number of cases have now been recorded in which unilateral renal disease has been the cause of hypertension in the human subject. In some of these the hypertension disappeared when the faulty kidney was removed; but in others secondary vascular damage in the opposite kidney had already occurred and residual hypertension remained. In view of the experimental work of Wilson and Byrom it is important in such cases that the damaged or functionless kidney should be removed as early as possible. Derow and Altschule,[4] who come to the same conclusion about malignant hypertension as Wilson and Byrom, consider that the pathologists who in the past have thought it to be a specific disease have been misled by grouping together pathologically identical cases and finding that their clinical histories were similar. A more accurate characterization of malignant hypertension is obtained by the opposite process of examining the varied pathology of cases clinically identical in their final stages. These authors set out the conditions in which malignant hypertension has been known to occur, and include in their list essential hypertension, secondary hypertension due to renal disease of various types, and hypertension secondary to endocrine disease and to lead poisoning.

Whether primary essential hypertension is always, or even usually, due to ischaemia of the kidneys in the first place is by no means certain. It is an attractive hypothesis in view of Goldblatt's work and of the fact that in the majority of cases renal arterial changes can be found; but Raab,[5] in a recent article on the origin of essential hypertension, recalls the experimental studies which show that hypertension can be produced also by artificial impairment of the cerebral blood supply, especially if the arterioles to the vasomotor centres are affected. He also gives clinical evidence that this may be the cause of many cases of hypertension in man, and concludes that the problem is not a simple one, and that in most cases three factors—hormonal, central, and renal—are probably operating.

1 *J. exp. Med.*, 1934, **59**, 347.
2 *Lancet*, 1939, **1**, 136.
3 *Quart. J. Med.*, 1941, **10**, 65.
4 *Ann. intern. Med.*, 1941, **14**, 1768.
5 Ibid., 1941, **14**, 1981.

SURGERY IN LIBYA

In dispatches from correspondents in Libya fitting mention has been made of the gallantry displayed by the different units of the armed Forces, but only rarely does one read of the part played by the medical services, which, in a campaign such as the recent disastrous one, must have been taxed to the utmost. In preparations for the fighting in the desert the D.M.S., Middle East, had obtained extra transport so that the light sections of certain C.C.S.s should be independently mobile, and the heavy sections at least more mobile than they had been in the past. Mobile operating theatres, each consisting of a sterilizer and an operating van, have proved suitable to desert conditions and "a great boon." In the offensive which began in November last year it was not found possible to keep in constant touch with the surgeon, and the difficulties of travel for ambulance cars was, to say the least of it, considerable. Many of the surgeons in the battle zone were under fire, and some even worked in captivity for varying periods of time. In Libya, we are informed, "the enemy appears to respect the Red Cross so long as it does not conflict with his interpretation of the needs of the tactical situation."

There were certain obvious difficulties in the working of the forward surgical service. Delay in communications led to loss of touch between headquarters and the various units. Transport was not always available when it was wanted, and rationing of water made sterilization and the washing of towels difficult. Lighting was another problem, some surgeons having to work in their operating tents with the aid of hurricane lamps. A familiar complaint is heard in the observation that records were bad and that "surgeons will not write legibly and print their names." Evacuation by air was a feature of the winter campaign, and over a thousand seriously wounded cases were comfortably transported by air from the battle zone either to forward aerodromes or to the base. Among the special centres there were five orthopaedic, two maxillo-facial, two neurosurgical, and two chest units with the Forces. There was apparently some opposition to the transfer of cases to special centres, but no doubt remains that the standard of treatment at them is very much better than at a general hospital. Cases not evacuated by air have taken as long as eight days or more to reach the base hospitals, and in spite of the increased mobility of the surgical units it took most of the wounded twenty-four hours or longer before they came under the care of a surgeon. But, in spite of these and other handicaps, results appear to have been highly satisfactory. By December 29, 1941, for example, there had been no case of tetanus.

Some observations from the base are of interest. "If," we are told, "the forward surgeons could see the big difference in the state of the excised wound as compared with that which had only sulphanilamide powder and dressing, they would realize how much the recovery time is shortened." Again there is a certain amount of complaint about record-keeping. For example, in several cases in which the wound had been enclosed in plaster, no mention was made either on the plaster itself or on the card whether the wound had been operated on or whether a tube had been put in. The dosage and times of administration of sulphonamide were not always stated. There was a high proportion of wounds of the lower limb, and a high proportion in which wounds were complicated by fracture. Many wounds were operated on in the forward area, débridement was carried out, the wounds were "saucerized," sulphanilamide was dusted on the surface, and the wounds covered with a vaseline dressing or loose pack. Cases treated in this way do "extremely well." With the exception of a very few cases, wounds which had been sutured were badly septic on arrival at the base, the sutures cutting out and the patient being in pain from suppuration under tension. It was observed that drainage tubes have been found put in "out of sight in the depths of wounds." Rubber tubes or tissue were found useless for drainage of wounds with established infection. When devitalized and infected muscle was excised, the wound was dusted with sulphanilamide, and a vaseline gauze pack provided drainage, the general condition of the patient improved and the infection did not spread. Another observation is that early amputation of a mangled limb was not only well tolerated but produced "a dramatic improvement in the general condition." Some points made about amputation were that the stumps were sutured far too often, and that cases in which complete skin closure had been done arrived at the base with the sutures cutting out and the skin sloughing. It is stressed that amputation under battle conditions should be planned to permit re-amputation at one of the sites of election, and that when possible some flap should be cut and allowed to fall over the end of the stump. A few loose sutures could be tied over a loose dressing after the stump has been dusted with sulphanilamide, and it is considered inadvisable to apply a plaster cover over the stump at a forward operation centre.

From experience at the special centres it appears that patients with uninfected haemothorax arrived in excellent condition, and that the condition of patients with open pneumothorax improved once closed drainage was established. It would be highly advantageous if some form of closed drainage during transport could be devised. The importance of the proper treatment of wounds is again emphasized by experience of workers at the head centres. Those wounds which healed by first intention had been "thoroughly treated by excision and wound toilet," and it is believed that if other cases which were badly infected had been so treated the incidence of infection would have been less. A brief report of a case in which a brain injury had been packed, followed by cerebral abscess and death, is accompanied by the injunction, "Head wounds should never be packed."

Two types of fracture of special interest are recorded. The first is compression fracture of the spine, which occurred largely in Naval ratings, who sustained the fracture by hitting their heels against the bilge rail when sliding down the side of a sinking ship. Compression fracture of a lower dorsal vertebra was also found in men swimming too near a depth charge, which blew them into the air. The second type is fracture of the os calcis, which occurred, for example, in men standing on the upper deck and receiving a severe impulse from below as the result of a bomb exploding between decks. This type of fracture has been severe, often bilateral, and sometimes compound.

DOCTORS AS POLITICIANS AND STRATEGISTS

If a group of Army officers, or even the 1922 Committee, were to come forward as advocates of the immunization of children against whooping-cough, the medical profession, whatever its opinion of the merits of the advocacy, would wonder with what authority and on the basis of what knowledge such groups of laymen might be presumed to act. The world would be a livelier place if associations of men expert in one branch of knowledge were every now and then to tell other associations how to manage their affairs. The Beekeepers' Association might like to be told how to look after their bees by, say, a group of Conservative engineers whose political views might impel them, for example, to protest against the premature extinction of

queen bees. Just as good as these hypothetical examples is the actual and recent resolution of the Socialist Medical Association, passed unanimously, "indicating its desire for the immediate formation of a second front," and a further pronouncement that this body "would urge that steps be taken to give effect to this policy without any dangerous delay." Such ineptitude can perhaps be excused on the ground of naivety, but one would have thought that medical men had enough to do now in their own professional work and in matters concerning the organization of their profession, without wasting time in passing resolutions on matters about which they are neither more nor less informed than any other reader of the daily newspapers. Even in the matter of the supply of medical personnel and equipment for an expeditionary force, we doubt whether the Socialist Medical Association has any information that is not available to the man in the street. If, however, they are speaking not as doctors but as politicians, and as Socialists feel bound to echo a cry that might be supposed to be welcomed by Moscow, then surely the grim realists who are courageously directing Russian policy must, if they have the time to spare, feel mildly amused at the picture of the English doctor turned strategist.

Let us hope that the example of the no doubt earnest men who form the Socialist Medical Association will not be followed by other doctors who hold other political beliefs. The public, we fear, would lose faith in the doctor's good sense if, say, a Liberal Medical Association, a Conservative Medical Association, a Social Credit Medical Association, perhaps a Fascist Medical Association—or even an Independent Medical Association—followed the lead of their prototype by offering gratuitous advice to the Government of the day on extramedical matters. Apart from the slightly ridiculous aspect of such sectional organizations ranged on lines of party politics, we believe that they do a disservice to medicine by weakening the influence of the doctor in public affairs.

A PURE PROTEIN FROM THE POSTERIOR PITUITARY

Whereas the constitution of other hormones has been investigated with some success, that of the hormones of the posterior pituitary remains shrouded in mystery. Indeed, for many years it has been a matter of controversy whether the active principles were separate entities or represented different manifestations of the action of a single substance. In 1919 Dudley first achieved a partial separation of the vasopressor and oxytocic fractions. His observations were confirmed and extended by later workers, who, by using more drastic methods, achieved almost complete separation of the two fractions, though the commercial samples still lag behind somewhat in this respect. However, when reliable methods of assay were devised, it was found that in crude extracts the proportion of, for instance, vasopressor to oxytocic activity was approximately constant for any given species. This led naturally to the suggestion that while it might be possible to separate the active principles artificially, yet they existed in the first place as single components of a large molecule.

The work of van Dyke and his colleagues[1] has now furnished direct evidence of this hypothesis. They have extracted from the posterior lobes of frozen ox pituitaries a protein which contains all the active fractions and which they claim is pure, so far as their physico-chemical investigations allow. Its purity was demonstrated by its constant solubility, and by examination in the ultra-centrifuge and in the Tiselius electrophoresis apparatus. These methods and elementary chemical analysis agreed in giving the protein a molecular weight of about 30,000, and the active principles were present in about the same proportions as they are in crude extracts. This protein is by no means the most potent substance yet isolated. Thus, while 61 microgrammes of solid are equivalent to one U.S.P. unit, previous workers have already isolated an oxytocic fraction said to be thirty times more potent. The prosthetic groups which constitute the active principles must therefore be far smaller and simpler than the parent molecule, a fact which makes their ultimate chemical identification more hopeful.

It might be suggested that these observations could be explained by the adsorption of the active principles by some indifferent medium. The experimental evidence renders this very improbable. But though we may therefore visualize a single molecule which comprises all the active principles, it seems unlikely that it is released into the blood stream as such, though there is as yet no direct evidence either way. So this discovery must lead to speculation on the purpose of the association of vasopressor, oxytocic, and antidiuretic activities in the same molecule. Is it just chance that these three hormones are linked together in the posterior pituitary, for storage purposes perhaps? Or has the association some deeper significance which we have yet to learn?

[1] *J. Pharmacol. exp. Therap.*, 1942, **74**, 190.

GRAMICIDIN

Readers of this *Journal* have been given the opportunity of following the work of Dubos, who by a selective method of a tedious and ingenious nature bred out from soil a bacillus producing a substance highly toxic to certain other bacteria, mainly Gram-positive cocci. The crude extract from this bacillus is now known as tyrothricin, and is separable into two components: gramicidin, which acts powerfully but almost exclusively on Gram-positive bacteria, and tyrocidine, which acts similarly but less powerfully on certain both Gram-positive and Gram-negative species. Although known from an early stage to be more toxic than penicillin, these substances have such remarkable properties—and, it may be added, are so much easier to produce—that much more will evidently be heard of them. It is clear from papers now being published in the U.S.A. that the manufacture of gramicidin has been taken up commercially, and quantities are available to a number of workers for various types of study. Toxicity has been investigated further by H. J. Robinson and H. Molitor,[2] who confirm previous observations that, whereas local application and oral administration even in large doses are harmless, the intravenous minimum lethal dose is small. The site of the lethal effect is not clear from their studies, nor do they provide an answer to the question whether the haemolytic activity of gramicidin, recently restudied *in vitro* by D. Heilman and W. E. Herrell,[3] has its counterpart in the living body. This question is perhaps only of academic interest, because all authors seem agreed that local application is the only clinical use for which gramicidin is suited. Heilman and Herrell[4] elsewhere point out an interesting parallel between the action of gramicidin and that of detergents: their selectivity for different bacterial species is similar—even extending to a closer parallel between gramicidin and anionic detergents and tyrocidine and kationic—both are haemolytic, and both are relatively harmless to tissues. These authors have shown this parallel to be even closer by demonstrating that gramicidin and tyrocidine strongly reduce surface tension; this effect, however, persists after heating, whereas bactericidal activity is thus destroyed. In all these studies the very low solubility of gramicidin in water has presented difficulties; an

[2] *J. Pharmacol. exp. Therap.*, 1942, **74**, 75.
[3] *Proc. Soc. exp. Biol. Med.*, 1941, **46**, 182.
[4] Ibid., 1941, **47**, 480.

alcoholic solution added to water produces a suspension, and it is in this unsatisfactory form that gramicidin has chiefly been used; how such a suspension will behave in contact with infected tissue is not altogether clear. Herrell and Heilman[5] have prepared a solution for clinical use by introducing glycerin in addition to alcohol as a solvent, and used it in ten miscellaneous cases as a local application. Several lesions due to haemolytic streptococci appear to have cleared up under its influence; staphylococcal infections, on the other hand, are evidently almost wholly resistant. A. E. Francis[6] also records the successful treatment of wound infection in which a sulphonamide-resistant streptococcus was concerned. Whether gramicidin or any other product of microbic origin will eventually be found to fulfil certain purposes better than either sulphonamides or any other class of antiseptic remains to be seen. That several classes of reagent should be competing for supremacy in different aspects of a task which not long ago was considered impossible of any real fulfilment is a truly remarkable position.

AIR DISINFECTION BY LIGHT

Only within the past few years have serious attempts been made to check the aerial spread of infection by disinfecting the air itself. Of the various methods by which this can undoubtedly be done chemical spraying has been most studied in this country, and an adequate basis for a practical campaign is afforded by existing data. In the U.S.A. more use has been made of ultra-violet light, and evidence is accumulating that where this method is employed continuously for long periods the incidence of air-borne infections diminishes. Burners can be installed in such a position as to irradiate only the upper layers of air in a room, and a non-reflecting ceiling ensures that persons in the room shall be unaffected, but convection currents bring the whole of the air within the light field. An exceptionally careful study of the effects of such an installation in a Philadelphia school is described by W. F. Wells, M. W. Wells, and T. S. Wilder.[7] Their observations covered a period of several years, during which irradiation was maintained in some class-rooms and not in others, and careful records were kept of all infectious disease. After detailed analysis the results are expressed as the percentage of susceptible children in each group who developed mumps, chicken-pox, or measles when cases occurred in the same room. The differences in some epidemics were very striking, particularly during an extensive outbreak of measles. In the "unirradiated" classes, consisting of older children, there were 141 (37.2% of the total) with no previous history of measles, among whom 88 cases occurred, an attack rate of 62.4%. Among the irradiated juniors there were 110 susceptible children (75.9% of the total), of whom only 24 developed measles, an attack rate of 21.8%: if home contacts were deducted from these total cases, the attack rates attributable to infection arising in school are 55.3% and 14.5% respectively. Although it has been claimed by others that radiant disinfection of air reduces the frequency of colds, no such reduction was observed in this study, probably because the investigation was made in a day school, and frequent opportunities of infection with the common cold occur at home. It is argued that if the infection were usually acquired in school, and the incubation period is assumed to be two days, the number of colds with onset on Wednesday, Thursday, or Friday would be more than three-sevenths of the total for the week; but records of many hundreds of colds show, on the contrary, that they amounted to slightly less than this fraction. This negative observation is nevertheless disappointing: colds and influenza—which may be expected to behave in the same way—are the chief scourges which air disinfection is designed to minimize. There have been several reports of success in preventing the spread of colds in residential institutions by ultra-violet light. The latest of them is by L. N. Sauer, L. D. Minsk, and J. Rosenstern,[8] who compared the effect of simple air-conditioning, a mechanical barrier, and an ultra-violet-light barrier, in an elaborately equipped hospital for infants. By mechanical barrier is meant that the infant was kept in a cubicle never entered by anyone, and attended to by a nurse through a sliding glass shutter. Either this form of isolation or the use of ultra-violet light clearly prevented cross-infection: the merits of the two systems are discussed. The mechanical barrier is expensive to install, and after a few weeks "a certain lack of stimulation of the infant is occasionally apparent." Ultra-violet light, on the other hand, although less costly to install, is much more so to run.

Direct ultra-violet irradiation of the operation field to ensure surgical asepsis is a proceeding of which much has been heard in the U.S.A., and D. Hart, who has been its chief advocate, has recently with S. E. Upchurch,[9] reported the results of five years' experience with it. His figures, which in sum are very large, give the frequency of infection in clean operation wounds of various types before and after adopting this method, and the improvement is remarkable. Whether it is due, as Hart contends, to the killing of atmospheric bacteria is another matter. In referring on earlier occasions to the work of Hart we have pointed out that his observations on the atmospheric flora of operating theatres are vitiated by failure to apply the coagulase test to staphylococci, and in conflict with those of Devenish and Miles,[10] who found the origin of staphylococcal infection in clean operation wounds to be glove perforations. Hart still makes no reference to these authors' work. So to criticize his argument is not to question his results or the value of his method; it is indeed possible that pyogenic cocci of whatever origin may be destroyed by ultra-violet light in the wound itself. Whether irradiation is capable of this effect is a question which could presumably be decided readily by animal experiment.

THE DRYING OF PLASMA AND SERUM

The Trustees of the late Sir Henry S. Wellcome have placed a sum of up to £20,000 at the disposal of the Medical Research Council for research into methods of drying blood plasma and blood serum to provide stable products for use in the transfusion of patients suffering from haemorrhage, shock, or other conditions calling for such treatment. By agreement between the Trustees and the Council, this gift is to be applied to the purchase, erection, and operation by the Council of a plant which will make it possible to test and develop these methods on a substantial scale. The need for the improvement of such methods is of particular importance at the present time, and the products will be made freely available for the treatment of sick and wounded at home, at sea, and abroad. The Medical Research Council has therefore expressed its appreciation of this timely and public-spirited action on the part of the Wellcome Trustees.

Sir Charles Sherrington, O.M., G.B.E., M.D., F.R.S., has been elected a Trustee of the British Museum.

[5] *J. clin. Invest.*, 1941, **20**, 583.
[6] *Lancet*, 1942, **1**, 408.
[7] *Amer. J. Hyg.*, 1942, **35**, 97.
[8] *J. Amer. med. Ass.*, 1942, **118**, 1271.
[9] *Ann. Surg.*, 1941, **114**, 936.
[10] *Lancet*, 1939, **1**, 1088.

War Surgery of the Extremities

This is one of a short series of articles based on lectures given at the British Postgraduate Medical School, Hammersmith

BLOOD TRANSFUSION

BY

JANET VAUGHAN, D.M., F.R.C.P.

The problems of transfusion in wartime are inevitably different from those arising in peacetime. In wartime to a large extent we transfuse healthy individuals suffering from sudden severe injury. In peacetime we transfuse sick people. The following discussion applies to wartime transfusions only. It must be remembered, however, that knowledge of the pathology of haemorrhage and shock is extremely limited, and that the teaching of to-day must inevitably be revised as our understanding of the problems involved increases.

Transfusion Fluids

To-day the following fluids are available for transfusion: fresh blood, stored blood, plasma, serum, concentrated red cells.

Fresh Blood.—This has proved impracticable for use under air-raid conditions. In the chaos of modern air raids or warfare it is impossible to call up and bleed donors. Transfusion fluids must be ready in store for immediate use or be brought in from outside the danger area at short notice. Fresh blood is essential for only a small group of chronic cases that do not need immediate treatment.

Stored Blood.—Experience has shown that blood taken into a glucose-citrate mixture will store for fourteen to twenty-one days at low temperature (2° to 4° C.) without undue haemolysis taking place *in vitro*. The survival rate of transfused red cells is not appreciably lower than that of fresh blood. The reaction rate, provided the blood is warmed to 40° C. before use, is no higher than with fresh blood (Brewer, Maizels, Oliver, and Vaughan, 1940). The diluent at present in general use is 100 c.cm. of 3% sodium citrate in distilled water, to which is added 20 c.cm. of 15% glucose in distilled water. The resulting 120 c.cm. is mixed with 420 c.cm. of blood (M.R.C. War Memorandum No. 1).

Plasma.—This may be prepared in three different forms—unfiltered, filtered, and dried. Unfiltered plasma is prepared by siphoning the supernatant fluid off the red cells after sedimentation has occurred by standing or centrifugalization. It is a cloudy fluid which should be kept in the ice-chest. Filtered plasma is passed through a Seitz filter after separation. It is a clear fluid free from cell debris and the fatty content of unfiltered plasma. It must be kept at room temperature, as clotting will inevitably occur in the cold; unless great care is taken in filtration clotting is extremely likely to occur even at optimum temperatures. For the use of the Army, plasma is now being dried by a process similar to that employed for drying serum. The protein content of fluid plasma is only 4 to 5%, owing to the presence of glucose-citrate diluent. The protein content of reconstituted dried plasma depends upon the amount of fluid added.

Serum.—Serum is also available in three forms—filtered, liquid, dry—and as serum citrate prepared from recalcified plasma (Clegg and Dible, 1940). Filtered serum is passed through a Seitz filter after separation of the clots. It is a clear amber fluid with a protein content of approximately 7%. Dried serum is prepared by a modification of the method of Greaves and Adair (1939). It is reconstituted for use by the addition of either distilled water or normal saline, and may therefore be given in varying concentration, depending upon the amount of fluid added. Serum citrate is prepared by the addition of calcium to plasma and filtration of the resulting fluid through a Seitz filter.

Concentrated Red Cells.—This concentrated suspension is prepared by removing the supernatant plasma from the red cells so that double the usual amount of haemoglobin is given in the same volume of fluid. It is no more difficult to administer than whole blood, and is thought to give rise to fewer reactions (MacQuaide and Mollison, 1940).

Before discussing the relative values of blood, serum, and plasma it is necessary to consider the types of case that will need transfusion. They may be divided into acute and chronic conditions.

Transfusion in Acute Cases

The acute group may be roughly divided into three types: (1) patients with haemorrhage so severe as to result in anoxaemia; (2) patients suffering from shock rather than blood loss; and (3) patients with severe multiple injuries and considerable haemorrhage without obvious shock.

1. Severe Haemorrhage

In sudden severe haemorrhage there is a rapid fall in circulating haemoglobin, with resulting anoxaemia. It is then as essential to replace oxygen as it is to restore blood volume, and transfusions of whole blood are required. This type of case has proved rare as a result of air raids.

2. Shock

Shock is a term that includes a variety of conditions which are still poorly differentiated. I use it here to cover those states in which circulatory collapse, lowered body temperature, and pallor occur. It is usually considered to be associated with a fall in blood volume (Whitby, 1941). Treatment must therefore be directed to restoring blood volume. This can only be done by the use of liquids of high protein content. Saline is useless. Gum acacia was employed for this purpose in the last war, but it is difficult to prepare and is apt to cause liver damage. More recently it has been suggested that isinglass (fish gelatin) might be used (Taylor and Waters, 1941). Experimental work on the purification of animal proteins is in progress, but, so far, human plasma and serum have alone proved to be satisfactory for the purpose.

The evidence available suggests that fluid plasma, fluid serum, and dried serum are of equal therapeutic value in the treatment of shock (Vaughan and Brown, 1941). There are as yet few data available as to the effects of dried plasma. In this country no greater reaction rate has been recorded with serum and plasma than with blood. This observation is of some importance, as, with the exception of Levinson, Rubovits, and Necheles (1940), observers in the States regard serum as an almost lethal fluid. In this connexion it should be noted that, while we invariably pass serum through a Seitz filter, this is not done in the States. At the N.W. London Blood Supply Depot there are records of the administration of 147 pints of fluid serum with two mild reactions, and of 367 pints of filtered plasma, also with two mild reactions. Much larger quantities of both have been used in the area, but it is difficult to obtain accurate records under raid conditions. It appears reasonable, however, to conclude that if severe reactions had occurred they would have been reported. In addition to the cases already recorded by Brown and Mollison (1940) we have further details of thirty-four bottles of reconstituted dried serum given without reaction.

Serum would seem to have certain practical advantages over plasma. It is easy to keep sterile, while plasma becomes readily infected. Serum does not clot, but hitherto it has proved extremely difficult to prevent plasma clotting either during or after filtration. The protein content of serum is higher than that of plasma. Further, serum is easy to handle, store, and transport. Plasma has one advantage over serum—namely, that out-of-date blood can be used for its preparation. It therefore seems probable that there is a place for both plasma and serum in any transfusion service.

For the purpose of discussion, cases of "shock" may be divided into three arbitrary groups: shock associated with multiple injuries other than crush injuries; shock associated with crush injuries; and shock associated with burns.

Shock associated with Multiple Injuries other than Crush Injuries.—In this condition there appears invariably to be lowered blood pressure unassociated with haemoconcentration. The pulse may be either rapid or slow. The only reliable guide to the success of any therapeutic measure has proved to be a maintained rise of blood pressure. It is impossible to lay down any hard-and-fast rule as to the dosage required to produce such a rise in pressure. Every case must be treated on its merits. Enough fluid must be given to raise the pressure and to maintain it at a level above 100 mm. Hg. No patient should be allowed to go to the operating theatre with a pressure that is much below 100 mg. It should be remembered that three or four pints of fluid, or more, may raise the pressure when one or two have failed. It would seem from our own

published figures that many cases of circulatory collapse may be satisfactorily treated by blood derivatives, but whether, alone, they are preferable to whole blood remains to be seen. We have been struck by the occurrence of relatively low haemoglobin readings in patients with traumatic shock resulting from enemy action who have had no gross and obvious source of haemorrhage. Also, patients who have been successfully treated with plasma or serum have on subsequent examination shown haemoglobin readings in the neighbourhood of 60%. Such preliminary observations suggest that the ideal treatment for a patient suffering from air-raid shock may be one or two bottles of plasma or serum followed by one or more bottles of blood, the treatment being controlled by repeated haemoglobin and blood-pressure readings. This procedure has been carried out successfully in a large number of recorded cases.

Shock associated with Crush Injury.—A series of cases of crush injuries associated with renal failure have recently been described (Bywaters and Beall, 1941; Beall, Bywaters, Belsey, and Miles, 1941; Mayon-White and Solandt, 1941). The pathology of this condition is not for discussion here The treatment still remains uncertain and, with few exceptions, unsatisfactory (Longland and Murray, 1941; Henderson, 1941). It is important to remember that haemoconcentration in this condition may be pronounced. Figures as high as 160% have been recorded (Bywaters and Beall, 1941). It is obvious that in such a case serum or plasma should be used instead of whole blood. The amount to be given must be decided afresh for each case, the blood pressure and haemoglobin being used as the guide to dosage. The gross waterlogging of the tissues found at necropsy in some of these cases after massive saline transfusions suggests that saline is to be avoided.

Shock associated with Burns.—Shock associated with severe burns is characterized by haemoconcentration, which may be severe. In a series of 13 cases of burns seen by Dr. Brown haemoconcentration was present in all those in which observations were possible, with one exception. In that case the patient was seen within twenty minutes of the injury. At this time both blood pressure and haemoglobin were within normal limits. Two pints of serum were given, and neither haemoconcentration nor fall of blood pressure occurred. It is, however, exceptional to see a patient so soon after injury. In burn shock, *par excellence*, there would seem to be a special call for the use of either plasma or serum, as fluid of a high protein content must be given to restore and maintain the blood pressure at a normal level. Repeated haemoglobin estimations may be impossible owing to the extent of the burnt area. If they can be done, however, they offer a valuable additional guide to dosage. Cases of burn, even if they have a normal pressure when first seen, should be immediately transfused; prevention is better than cure. Transfusions should begin before the patient is taken to the operating theatre to be cleaned up, and if the burnt area is extensive should be continued throughout this process and, if necessary, when he has returned to the ward. Subsequently intravenous therapy must be determined by the patient's condition.

3. Severe Multiple Injuries and Haemorrhage

Grant and Reeve (1941) described a group of cases in which there was normal blood pressure in spite of severe multiple injuries and haemorrhage. Out of a group of 100 cases 28 presented this picture, and of these only 6 did not finally receive transfusion. In 13 cases the blood pressure fell considerably and the pulse rose within four hours of admission. In most the collapse occurred before operation, in a few it was delayed until during or after it. Transfusion was followed by rapid improvement. In 9 of the patients transfusion was started soon after admission, though the blood pressure was not low, and the condition remained satisfactory except when further bleeding occurred. As with burns, early transfusion prevents later collapse in severely injured cases. In other words, our guide in resuscitation work should be in the severity of the injury sustained and not the blood pressure or pulse level. Patients with multiple injuries and severe burns must be transfused as an urgent method of resuscitation. It is wiser to prevent circulatory collapse than to treat it. Patients in this group respond well to serum or plasma as an initial dose, but probably should receive blood in addition when it is available.

Transfusion in Chronic Conditions

The following two groups of patients require transfusions in the later stages of treatment: (1) those with burns, and (2) those with septic wounds.

Burns.—Localized oedema often occurs in the neighbourhood of a burnt area twenty-four hours after injury. There is some evidence that this may be reduced by the administration of twice-concentrated or four-times-concentrated serum. It would appear wise to continue to give concentrated serum so long as oedema persists, unless the patient becomes intolerant of fluid by mouth; in such cases normal serum is preferable. In the late toxic stages, when sepsis has become an important factor, whole fresh blood should be given, if necessary, in large repeated doses by a drip technique. Satisfactory healing is dependent to a large extent upon maintaining an adequate haemoglobin level.

Septic Wounds.—Patients with infected wounds often show considerable anaemia. This is unaffected by the usual haemopoietic remedies (Vaughan and Saifi, 1939). Plasma proteins are also usually low. It is essential to raise both the haemoglobin and the plasma protein level in such patients if satisfactory wound-healing is to take place. This is done by repeated large transfusions of fresh whole blood. These transfusions should aim at raising the haemoglobin level to 100%. Several pints may be given by drip technique during twenty-four to forty-eight hours. Having raised the haemoglobin it must be maintained at an optimum level. Concentrated suspensions of red cells are useful for this purpose, especially in elderly subjects in whom it is important not to increase the blood volume.

Some Technical Points in Transfusion

Temperature of Administration.—If circumstances permit it is wiser to warm blood, plasma, or serum to body temperature before administration. This can be done by standing the blood-bottle in water at 40° C. for twenty minutes and mixing it gently at intervals. Under air-raid conditions it is often necessary to give the first bottle cold, but while this is being done the second can be warmed.

Rate of Administration.—With a young patient it is probably safer to give large quantities of fluid rapidly than it is with an older patient, but again it is difficult in our present state of knowledge to lay down any hard-and-fast rules for guidance. When the patient fails to respond to two pints of fluid administered rapidly, a careful watch should be kept on the base of the lungs if further rapid transfusion is considered. In practice we give the first two pints rapidly, using a reversed Higginson syringe to apply pressure if necessary, and subsequent fluid more slowly by drip technique. It should be remembered, when it is necessary to use the veins in the leg, that these are likely to be extremely collapsed, especially in the badly shocked patient, and that pressure is essential to start a flow of fluid. After the first pint the flow can usually be maintained by simple gravity.

Filtration.—Stored blood and derivatives should always be passed through a filter before administration. The routine administering unit in this country is fitted with such a filter. A fatality has recently been recorded in the States from giving unfiltered plasma (Mayner, 1941). At necropsy fibrin plugs were found in the lung capillaries.

Cross-matching.—It is the usual practice in this country at present to issue universal donor blood only. Theoretically, therefore, it should not be necessary to cross-match the cells of the donor with the serum of the recipient. When possible, however, it is wise to do this, as errors in grouping cannot always be avoided and such a cross-match serves as a double check. In the case of serum and plasma no cross-matching is necessary. Both serum and plasma are prepared from pooled supplies, and it is found that as a result the agglutinin titre becomes either negative or so low as to be insignificant. Even in the early days of plasma transfusion in this country, before pooling was carried out, it was found that no ill effects followed the transfusion of a Group B donor, for instance, with large quantities of Group A plasma, and vice versa.

Transfusion Reactions

The ideal transfusion should have no effect on the patient beyond improvement; reactions may, however, occur. They take various forms, varying considerably in severity. The mildest type shows a slight rise in temperature; in others there is a severe rigor, often associated with a pain in the back, vomiting, and headache or generalized urticaria. In some instances in which incompatible or grossly haemolysed blood has been given there is a haemolytic crisis, resulting, unless promptly treated, in death. When a severe rigor occurs, the question at once arises whether the transfusion should be stopped. Every case must be decided on its merits; in a severely anaemic patient or a shocked air-raid casualty it is wiser to continue the transfusion in spite of the rigor. In the less acute case the transfusion may be stopped.

In the case of an incompatible transfusion, prompt measures must be taken if the patient's life is to be saved. It is essential to maintain an alkaline urine. Alkali should be given by mouth and, if necessary, by intravenous injection. The patient should be catheterized twice a day if there is retention. It should not be assumed that failure to pass urine means complete anuria. Fluids, especially glucose solution, should be given in large quantities, if necessary per rectum or intravenously.

Summary

The use and relative value of whole blood, serum, and plasma for transfusion purposes are discussed.

Whole blood is preferred in acute severe haemorrhage; plasma and serum in conditions associated with haemoconcentration—i.e., burns and certain cases of crush injury; and a combination of plasma and serum, with whole blood, in patients with severe multiple injuries.

In the case both of burns and of injuries the severity of the injury and the degree of blood loss rather than the blood pressure and pulse should indicate the necessity for transfusion.

No rules for the precise dosage of any transfusion fluid can be laid down. It is essential to raise and maintain the blood pressure over 100 mm. Hg. The dose required to do this is extremely variable.

Serum and plasma appear of equal clinical value, and both are non-toxic. Serum has certain practical advantages over plasma.

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ACCELERATED MEDICAL COURSE AT TORONTO

The acceleration of the medical course at the University of Toronto to meet the shortage of doctors for the armed Forces and for civilian needs was decided upon in the spring of 1941. The proposed curriculum consisted in lengthening the academic session from 7½ to 10 months in all years of the course but the first, which is made up of pre-medical subjects. This procedure will ensure that a class of students graduates every eight months instead of every twelve as at present. As it has been thought essential that each graduate should have a period of interneship in a hospital in order to round off his education, either to begin private practice or to become a medical officer in the Forces, the hospitals were asked if they would shorten the interneship period from 12 months to 8 months so that medical officers might be made available for military service as quickly as possible and at the same time provide for the co-ordination of the interneship period with the graduation of students every 8 months. Provincial licensing bodies were requested to permit the medical curriculum to be completed in a shorter time than their regulations required. Both the hospitals and the licensing bodies agreed to the proposed changes as a war measure.

University of Toronto Course: Graduation, Interneship, Military Service

1941–2	Graduation	Interneship	Available for Military Service	
			Speeded-up Course	Regular Course
6th Year ..	Apr. 30, 1942	May 1, 1942 to Dec. 31, 1942	Jan. 1, 1943	July 1, 1943
5th Year ..	Dec. 31, 1942	Jan. 1 to Aug. 31, 1943	Sept. 1, 1943	July 1, 1944
4th Year ..	July 30, 1943	Sept. 1, 1943, to Apr. 30, 1944	May 1, 1944	July 1, 1945
3rd Year ..	Apr. 28, 1944	May 1 to Dec. 31, 1944	Jan. 1, 1945	July 1, 1946
2nd Year ..	Dec. 31, 1944	Jan. 1 to Aug. 31, 1945	Sept. 1, 1945	July 1, 1947

The accelerated curriculum at Toronto came into operation when the second- to sixth-year classes registered on Aug. 25, 1941, the effects of which are shown in the accompanying table. As the result of this speeded-up curriculum, the sixth-year class will take the place of the present class of internes in hospitals on May 1 instead of July 1, making them available for military service 2 months earlier than would ordinarily be the case. This present sixth-year class will be available for the Forces on Jan. 1, 1943, instead of July 1, or 6 months sooner; the fifth-year class will be available 10 months, the fourth-year 14 months, the third-year 18 months, and the second-year 22 months earlier. The curricular changes in the courses of each of the years have been only of a minor character, the time-tables in each year consisting of the three terms of the present course, to which has been added the first term of the next succeeding year, in the fourth term from April to June. The total length of the actual instruction is such that each student receives practically the same sound medical training as in the regular course, but in a shorter period.

Correspondence

Post-war Medical Reorganization

SIR,—There are few members of the medical profession who will not have read, with interest and profit, the Interim Report of the Medical Planning Commission, to which document you have so rightly given first place in your issue of June 20. Being an interim report, published for the purpose of stimulating discussion within the profession, it is not comprehensive, and, for the same reason, the proposals contained in it are capable of amendment.

Writing as a member of the public health service I should like to express the view that the fundamental principles underlying the report, such as central control by the Ministry of Health or a similar body, and administration by enlarged local authorities or *ad hoc* regional bodies, are sound and worthy of support by the profession as a whole, including those engaged in the public services. It is, however, important, when the scheme has been fully discussed by the profession and is presented in its final form, that we should make up our minds which of the various alternatives we wish to support. Should the scheme be administered centrally by the Ministry of Health or by a specially appointed body, and at the periphery by local authorities or by newly formed authorities created for this purpose only? These points are not matters of detail, as the success of any scheme involving such a complicated issue as the integration of all the present medical services into one complete system depends largely upon the suitability and competence of the bodies chosen to supervise and administer it.

The report itself suggests the answer to one of these questions when it emphasizes that "the system under which local authorities administer in detail a broad national policy decided by the central Government is deeply embedded in the social fabric of this country." This would seem to be a conclusive argument in favour of peripheral administration by enlarged local authorities appointed for all purposes, and there is the further reason that the present major authorities have already co-ordinated some of the medical services which are referred to in the report, including their hospitals, many of the personal health services, and the services concerned with environmental hygiene. Moreover, the influences favouring a satisfactory condition of health within the community are by no means wholly medical. Apart from questions of nutrition and standards of living, which are only slightly influenced by the action of local authorities, there are such matters as housing, education, the provision of baths and wash-houses, abattoirs, parks and recreation grounds, crematoria, etc., all of which in the hands of local authorities play a part in affecting favourably the health of individuals living in urban communities. On its merits the argument for allowing local authorities to take a share in the administration of the new medical service seems a sufficiently strong one; but, apart from this, it would seem to be politically wise to enlist the support of the powerful influence of the local authorities in favour of the profession's agreed scheme rather than to risk disaster by provoking their equally powerful opposition. On the whole the major local authorities, if of sufficient size and possessing adequate rateable value,

are efficient administrative bodies within the limits of their legal powers; they possess other services, apart from those dealing with public health and hospitals, which are of great assistance to a medical department; and their members, becoming keenly interested in health problems, form committees which, as a rule, are just as efficient in discharging their duties as would be the theoretically more perfect regional councils suggested in the interim report as an alternative.

I would emphasize that the essential things are size and rateable value. A drastic reorganization of local government areas is long overdue, but if the Government after the war performs this essential task adequately the units thus formed should be perfectly capable of playing their part in the new medical organization. The medical services in each area would then, in some respects, be analogous to the education service of the present day. The local authority would provide, equip, and maintain health centres on the basis of a grant from the Exchequer just as it now provides schools on the same basis. It would possess a statutory committee, similar to the education committee or the public assistance committee, to which all questions relating to the public medical service would be referred. In the interests of the medical profession, arising out of the more important interests of the patient, the local authority would be strictly controlled by regulations made by the appropriate Government Department in regard to its relations with the medical personnel in its area. Under any scheme for improving the manifest inefficiencies of the present system some increased measure of State control is essential. If that control is directly exercised from Whitehall or indirectly maintained by regional offices under the Ministry there will ensue a full State Medical Service with all the manifold disadvantages in loss of freedom to the profession which such a system entails. If, on the other hand, a less rigid system of control, designed to make the system work but not to cramp initiative, were entrusted to enlarged local authorities under regulations framed to provide as large a measure of freedom as possible to the profession, the objective which the Medical Planning Commission has before it might be attained. Much would still have to be done by the central authority, and the interim report is by no means clear as to the machinery to be used by that body for the transfer of practitioners, including consultants, from one area to another, to ensure the provision of satisfactory hospitals in all parts of the country, to coerce backward or unsatisfactory local authorities, and to obtain consultation between neighbouring local authorities in regard to matters of common interest. It is certain, however, that the performance of functions of this kind, together with the control of the financial aspects of the new service, the issue of regulations, and the supervision of the activities of the major local authorities, would necessitate the formation of a strong division at the Ministry of Health administered by a principal assistant secretary and a chief medical officer.

In discussing or considering post-war medical reorganization one is always confronted by the problem of reconciling the increased measure of State control, which is essential if any comprehensive public medical service is introduced, with the freedom of the medical profession. Ordinary safeguards incorporated into a Medical Services Act might be gradually relaxed in amending Acts as time went on. A safeguard of a permanent character, unlikely to be weakened so long as our political system remains similar to what it is now, would be the placing of responsibility for the detailed administration of the co-ordinated medical services in the hands of enlarged major local authorities. Other but less effective safeguards would be the continuance of some voluntary hospitals and of a limited amount of private practice and the survival of the General Medical Council in something like its present form.—I am, etc.,

Liverpool. W. M. FRAZER.

"Positive Health"

SIR,—In the Medical Planning Commission's Interim Report they put as a first aim of a medical service the "achievement of positive health." The phrase is a little unusual and it is essential to be perfectly clear what it means. I take it to mean a degree of health at or above the average, so that, for example, I may be said to be in a condition of "negative health" during the day following a night of hard work. If I am right in this surmise—and if I am not I hope some member of the Commission will correct me—the phrase amounts to the promotion of personal hygiene. If this be so I am sure everyone will support the aim, provided the idea is never carried to the length of any suggestion of Government interference with personal liberty as, for example, in the prohibition experiment in America.

But I would submit that the subject of personal hygiene is still in the pre-scientific stage. We all try to inculcate it on our patients, incidentally often on the lines of "Do as I say and not as I do," and it remains too true that in this respect "a man of 40 is either a fool or his own physician." Personal hygiene is the happy hunting-ground of faddists and fashions. It seems to me that before the aim becomes an achievement personal hygiene will have to be erected into something of a science by the old methods of long, laborious, and completely unprejudiced research.

Let us not lead the public to suppose that we can confer the great gift of exuberant health.—I am, etc.,

Dover. A. R. JORDAN.

The Pre-natal Clinic

SIR,—The war is sometimes blamed for conditions which might be more correctly ascribed, at any rate in part, to our lack of enterprise. Perhaps it was inevitable in 1939 that the educational side of our health services should largely go to the wall, but the time has come when it is more than ever necessary to resume our health teaching. Pending the introduction of mothercraft classes in schools, it is important to concentrate upon the teaching of mothercraft in our pre-natal clinics. The young expectant mother is an exceptionally receptive subject for this teaching and welcomes it when it is provided.

What is to be avoided is the "hospital atmosphere" still too often associated with the pre-natal clinic, and the handling of expectant mothers as though they were a pack of cards. What do we find but a long row of women waiting on benches "to see the doctor," whispering tales of complicated confinements to each other, and exchanging accounts of their own symptoms which each tries to make more sensational than the last. The influence of suggestion is marked; on some days there is an epidemic of pain in the legs, on another frequency of micturition, and on a third abdominal cramp. Nearly always the attention of the woman is focused on a physical symptom rather than on the proud expectancy of childbirth. And the visit to the clinic is synonymous to her with getting on a couch to have her abdomen palpated "in case anything is wrong."

Surely the psychological effect of a clinic run on the above lines cannot be right. Pregnancy is not a disease of nine months' standing. It is a physiological condition and should not be associated with the idea of illness. The expectant mother is not a case or a patient. From the moment the mother enters the clinic she should receive instruction combined with entertainment, the programme of training for her new role of motherhood being made as interesting as possible. Medical supervision is necessary and desirable, but should be carried out without ostentation and with a cheerfulness as far removed as possible from the "bottle of medicine" line of approach. The doctor must certainly examine to ensure that the mother is obstetrically fit; although, once the pregnancy is found to be normal and the date of confinement confirmed, the frequency of abdominal palpation, so often purposeless, now in vogue is unnecessary. The health visitor will help her to make arrangements for the confinement and the hospital sister will give the requisite instructions; but these will be sandwiched in with the dressmaking stall, the cookery demonstration, and the class for physical exercises, the rhythmical dance music from the latter pervading the clinic and proving an excellent antidote to any thoughts of backache.

Reformers are seldom appreciated in their lifetime, but we hope that an exception may be made in the case of Dr. Kathleen Vaughan, whose book *Safe Childbirth* is such a valuable contribution. It is under Dr. Vaughan's personal supervision that physical exercises to train expectant mothers for childbirth have been conducted at Paddington (L.C.C.) Hospital since last September, and are proving very popular. The prospect of "radiant motherhood" shown by these girls, laughing together as they swing their limbs in unison to the gramophone, is one of the happiest sights imaginable. Further

classes are now being established as ancillaries to the clinics of St. Mary Abbots (L.C.C.) Hospital and to those of the Kensington Borough Council.

It is submitted that these classes in physical exercises, including relaxation, mark a considerable forward advance in obstetrics. Hitherto there has been too much acquiescence in the increasing difficulty of labour. If our nation is to play a leading part in the world of the future, it is necessary to produce a healthy and prolific post-war generation. This is not likely to come about if childbirth is regarded in the same light as a surgical operation. Why not determine to bring it back to the normal event which it still is in races whose women lead less sedentary lives?

Physical exercises must, of course, be combined with proper feeding, and few would question the desirability of food advice bureaux at the pre-natal clinics. Here the expectant mother obtains advice on dietetics together with practical and topical hints on cookery. The pioneer of these bureaux was established at the Soho Hospital for Women in October last, where a cooking demonstration is held for the waiting out-patients. In the clinics of the Kensington Borough Council a trained dietitian of the London County Council working in co-operation with the Ministry of Food has kindly lent her services for this purpose and gives short demonstrations to the mothers, followed by an informal discussion. At Paddington and St. Mary Abbots (L.C.C.) Hospitals such bureaux have been started in the ante-natal departments and the mothers are very appreciative of this service. A third point on which useful advice can be given to the expectant mother is in the matter of baby clothes. Wool, bought at a reduced price and sold in the Kensington Welfare Centres, makes a useful opening for demonstration of the best types of infants' garments and often develops into a knitting or sewing class.

Clinics on such lines fill a definite need of the pregnant woman and afford the means of keeping her under unobtrusive medical supervision and guiding her into healthy ways of living. The health visitor and hospital almoner can help her in her troubles and get her into touch with any organization whose assistance she may need. And the society of other young mothers affords the opportunity of lasting friendships. It is undoubtedly more trouble to organize a clinic on such lines in wartime, but the wives of our men in the Services deserve the best we can give them. Those of us who perforce have to remain at home have a duty in this respect. And is it not the best way to keep up morale of those at the front to give their wives a fair deal? It is to be hoped that all clinics for the expectant mother of the future, whether at hospital or health centre, will be run in a way which emphasizes the ideal of health and not the idea of disease and in which constructive hygiene as preached and practised by Dr. J. S. Fairbairn is given foremost place. In this atmosphere the doctor escapes from what Prof. Charles McNeil (April 4, p. 479) has so aptly described as "the deadening effect of the treadmill of clinics."

The writers of this letter must add the usual disclaimer on behalf of their respective councils of any responsibility for their personal views. They would like to express their gratitude to Dr. W. Allen Daley, Medical Officer of Health of the L.C.C., for his interest and granting facilities, and to Dr. James Fenton, Medical Officer of Health of Kensington, for his help and encouragement.—We are, etc.,

WILLIAM C. W. NIXON.
VIOLET RUSSELL.

London.

Medical Women in the Forces

SIR,—Referring to my previous letter (April 18, p. 505) regarding the status of women doctors serving with H.M. Forces, I stated that medical women volunteering for service under the Army Council were offered two alternatives: (*a*) relative rank with the R.A.M.C. without commission, or (*b*) a commission in the Women's Forces to serve with the R.A.M.C., and that in the circumstances the Medical Women's Federation considered that "relative rank" only was preferable.

The Federation has since been informed that medical women will not in future be permitted to choose relative rank without a commission, but must be given a commission in the Women's Forces—i.e., they receive a commission in the Women's Forces to serve *with* the R.A.M.C. (a medical man receives a commission in the Land Forces to serve *in* the R.A.M.C.). We shall be glad if publicity can be given to this decision in order to avoid further misunderstandings.

The position as regards medical women serving with the R.A.F. Medical Branch has also now been clearly defined. The women are obliged to accept commissions in the Women's Forces to serve with the R.A.F.M.B. The appointments are gazetted as "To be Medical Officers with the relative rank of Flying Officer for employment with the R.A.F.," and they are shown in the Air Force List as "Women Medical Officers commissioned for employment with the R.A.F."—I am, etc.,

CLARA STEWART,
President, Medical Women's Federation.

Inhibition of Lactation

SIR,—Drs. Macpherson and Haultain have done right to draw attention to their previous reports, which I gladly acknowledge, on the use of triphenylchloroethylene and other oestrogenic substances for inhibiting lactation. In her paper on this subject (*Journal*, May 16, p. 601) Miss Barnes mentioned the first investigation by Macpherson and Robertson, and at the time of preparation the most recent work by Haultain and Macpherson had not been published. My letter was intended as an addendum to Miss Barnes's paper, and I therefore did not introduce new references, although I now regret the omission.

Although in my experience the drug, when injected in a single dose of 250 mg. in 5 c.cm. of sesame oil (first tried in a few cases two years ago and repeated again recently), has not given such good results as those reported by the Edinburgh workers, we all agree that oral administration in suitable dosage has an excellent effect. There is no doubt that the use of synthetic oestrogens for the inhibition of lactation has supplanted the older uncertain and painful methods of treatment.—I am, etc.,

Oxford. CHASSAR MOIR.

Complacency in Anaesthetics?

SIR,—Dr. E. C. Atkinson (June 20, p. 774) has asked whether any large-scale statistics are available of immediate mortality under anaesthesia apart from any added factor such as the magnitude of the operation or the poor condition of the patient. In other words, he asks for the incidence of primary cardiac failure due to anaesthesia.

It is now recognized that with a competent anaesthetist using modern techniques this event is so rare that an immense number of cases must be handled to obtain any reliable figures. Anaesthesia for dental extractions has been studied from this angle, and at large children's hospitals many thousands of cases are dealt with yearly without accident.[1] The usual techniques are open ethyl chloride or divinyl ether. One series of 123,000 consecutive cases with the former drug has been reported without incident,[2] as has another of 125,000.[3]

The mortality rate of expertly given nitrous oxide and oxygen for dental extractions is also infinitesimal. For example, 1,161,820 dental cases were anaesthetized with this method with 2 fatalities, a mortality rate of 0.00017%. Another series of 300,000 has been reported with no deaths.[4]

I believe that the vast majority of primary cardiac failure cases are due to gross errors in technique or to the employment of chloroform or a mixture containing it. With the advent of trichlorethylene the number of occasions when chloroform is justifiable is almost zero.—I am, etc.,

St. Albans, Herts. C. LANGTON HEWER.

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2 Sise, L. F., and Woodbridge, P. D., *New Engl. J. Med.*, 1930, Aug. 7.
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4 McCardie, W. J., *Proc. roy. Soc. Med.* [Sect. Anaes.], 1923, March 2.

SIR,—Dr. E. C. Atkinson (May 9, p. 595, and June 20, p. 774) appears to have laid himself out to criticize the McKesson machine. Why the machine? Surely he cannot blame a machine for any death. The machine is worked by someone, however incompetent, and the administrator is the one to blame, if there is any blame. I am afraid that when this machine came out a very large proportion of men considered it to be quite foolproof, and with a certain number to-day that opinion

is prevalent. It is far from being foolproof; I cannot conceive of any mechanical device being foolproof. I have seen a McKesson worked many times by men who were grossly incompetent and who got into trouble. Recently I met a man who had been using a McKesson for several months and asked me where the bags were. During that period he had not even learned the mechanism. I should think he was about due for a death or two and then would promptly blame the machine.

I have heard criticisms like Dr. Atkinson's many times, but usually from men who either have never owned a machine or only use one occasionally: never from men who use it constantly and are in a position to criticize it. May I draw Dr. Atkinson's attention to the very convincing letter by Dr. Freda Bannister (March 14, p. 367) and also the one by Dr. Massey Dawkins (May 23, p. 653)? I have used McKesson machines since 1926 and my results are far better than they were under the "rag-and-bottle" regime. The "rag-and-bottle" method may be fairly safe on the table, but what about the after-effects? The opponents of the machines are usually silent on these matters. The McKesson is, to my mind, the Rolls Royce of machines, as stated by Surg. Cmdr. H. Parry-Price (June 13, p. 738), but it is certainly not foolproof and cannot be blamed if it is used by incompetent people.—I am, etc.,

J. B. H. HOLROYD, D.A.,
Anaesthetist, Sheffield Royal Infirmary.

Vitamin B and Toxaemia of Pregnancy

SIR,—The article by Prof. W. C. W. Nixon, Dr. Margaret Wright, and Mr. E. C. Fieller (May 16, p. 605) was of great interest to us in view of the following case.

A primigravida aged 19, attending the ante-natal clinic of this hospital, was apparently normal until 33 weeks, when her blood pressure was 130/86, previous readings having been about 120/70. She did not attend when requested, and her B.P. was found to be 190/120 at 37 weeks, and she had albumin + + in the urine. She felt fit and well, but came into hospital on being pressed, afterwards admitting that her face, body, and legs had swollen noticeably. Conservative treatment as follows was started immediately: (1) Complete rest in bed, with a radiant heat bath for 20 minutes twice daily. (2) Nothing by the mouth beyond barley-water or marmite prepared as a beverage, pot. cit. gr. lx four-hourly, and mag. sulph. ʒij twice daily. (3) Enemata as required to maintain frequent stools.

After two days as above she was allowed sandwiches of marmite or grated raw carrot, first one of each per meal and later almost *ad lib*. A small amount of fish and chicken was then allowed to relieve the monotony. The main part of the food taken was marmite—i.e., vitamin B_1—in one or other form. The result was surprising. The blood pressure fell from 192/120 to 186/96 over-night, then to 166/110, 130/90, 130/86, 130/90, 130/86, 130/84 on successive days, and the albuminuria and oedema disappeared completely. At her own request she was allowed home under medical supervision. When readmitted in labour her blood pressure was 144/90 and there was albumin + in the urine. Labour and puerperium were normal and she was albumin-free on discharge, with blood pressure 112/76. The placenta incidentally had four white infarcts, two of which were over 2 inches in diameter, and the whole maternal surface was studded with pin-head size calcified punctations.

The paper referred to above suggests that vitamin B_1 might be beneficial in pre-eclampsia. This case would appear to indicate that some part of the B complex is in fact strikingly beneficial. I have to thank Mr. R. Everett, F.R.C.S., M.R.C.O.G., for permission to publish this case.—I am, etc.,

WALTER CALVERT,
Resident Obstetrical Officer, Victoria Hospital, Blackpool.

The Mesentery in Regional Enteritis

SIR,—While the role of the mesentery in the development and dissemination of this lesion remains obscure, speculation is rife. Mr. Norman Tanner (June 13, p. 739) ranges himself beside those who regard the changes in the intestinal wall—ulcerative and hyperplastic—as secondary to lymphatic obstruction with mesenteric lymphadenitis; and he cites the oft-quoted experimental evidence of Reichert and Mathes in support of this theory of causation. These workers, it is well known, produced lymphoedema (hardly described correctly as "elephantiasis") in the bowel wall of dogs by the injection of sclerosing solutions into the mesenteric lymphatics. When the animals were killed some months later neither the characteristic ulceration nor fibrosis of regional enteritis was found, and apparently they were driven to the assumption of a "chronic low-grade bacterial infection" to explain these features of the human lesion. All of which seems rather like begging the question of aetiology, inasmuch as not a tittle of evidence has been produced about the nature of the hypothetical infection, bacterial, protozoal, fungal, or viral. Each species in turn has been incriminated as the causal agent—viruses seem to hold the field at the moment—but no proof of any has been forthcoming.

Mr. Tanner also emphasizes the obvious importance of removing the thickened mesentery and its glands along with the diseased gut. "The highest visibly affected segment" is an uncertain guide to this, for we have no knowledge whatever of the earliest stages of the process such as are incapable of detection by the naked eye. In practice we have found great difficulty in determining the true extent of the affected bowel, and believe that this failure to appraise accurately the limits of the disease at the first intervention is responsible for some of the recurrences after a "radical" operation. Even the so-called skip areas may be a snare, masking wide submucous extension of the condition beyond visible changes in the bowel wall.

En passant, has not the time arrived for the adoption of a uniform nomenclature descriptive of this clinical entity? Of the two titles used for it by Mr. Tanner, that which I have employed above seems preferable, though this is only a personal view. Eponyms abound in medicine, and it is unfortunate that they do, for they are often inaccurately assigned and as often invidious in choice. One pertinent example of this may suffice. The fact that Crohn and his associates rediscovered in 1932 a lesion which Dalziel (*Journal*, 1913, 1, 1068) fully described with a wealth of pathological detail in 1913—incidentally in a paper read at the Annual Meeting of the British Medical Association—is surely not evidence of the existence of "Crohn's disease." In the interests of accuracy I think this term should be abandoned.—I am, etc.,

Ashton-under-Lyne. F. G. RALPHS.

Tetanus after Sulphonamide Treatment of Cavities

SIR,—In view of the increasing application of sulphapyridine and sulphanilamide powder to septic and potentially septic cavities, and particularly to the peritoneum in peritonitis, I think I am justified in drawing attention to an inquest reported recently in the *Pharmaceutical Journal* (May 30), which I have not noticed published in the medical journals.

Briefly, a married woman of 34 was operated on for an unspecified pelvic inflammation on April 13. Free pus was found in the pelvic peritoneal cavity and sulphapyridine powder sprinkled therein. There are no details of what drainage was employed. On April 20 the patient developed tetanus and died the next day. The pathologist confirmed the presence of tetanus in the tissues. He examined the catgut, with negative results. In the cardboard of both containers of the sulphapyridine he found tetanus and in the actual powder from one of them.

Further evidence called disclosed that the powder had not been sterilized, but handed to the surgeon in a sterile swab. The medical consultant to the firm supplying the drug drew attention to the fact that printed on the label of the container was the advice: "The contents of this package have not been sterilized." He recommended sterilizing at 160° C. for 20 minutes. I believe, from the fact that in case reports of the use of this drug in operative surgery its sterilization is not stressed, that it is generally held that it is not necessary to sterilize it. I have seen it used straight from the packet in two or three hospitals and have used it so myself, believing that being a mild antiseptic it would not contain viable germs. For its application in surface work—skin grafting and extensive surface lacerations, for instance—sterilization is probably unnecessary, as tetanus rarely develops in such sites. But in view of the above case its use unsterilized in deep cavities, the peritoneum, and the wound resulting from a perineal excision of the rectum would appear to be very dangerous, as these sites favour growth of anaerobes.

Apart from the possibility of tetanus, the other question that the report raises is the use of the powder in the presence of free pus. Apparently it is contraindicated in these circumstances, because the chemical is inactivated by the pus. But is its use definitely harmful? One hears from time to time of its successful use in apparently hopeless cases of fulminating peritonitis with much free pus present. Is it justifiable in these desperate cases to calculate a maximum dose, based on the patient's weight and supposed tolerance under the circumstances, and put it in the peritoneum, assuming that half or more will be neutralized by the free pus and the remainder be available for action in the blood stream? If such a procedure is considered justifiable a routine full course of intramuscular pentnucleotide (Smith, Kilne, and French) might be started immediately.

It would be interesting to know whether any of the newer sulphonamides—succinyl-sulphathiazole and sulphaguanidine—now recommended for intestinal conditions and considered very little toxic would be better received by the peritoneum and more effective, owing to their selective action on the harmful bacteria of the intestinal tract.

At all events, it is obvious that in future sulphonamide powders must be sterilized carefully, and the statement in *The Surgery of Modern Warfare*[1] attributed to J. H. Key and T. H. Burford that "sterilization of the crystals does no harm but is unnecessary" must now be considered obsolete.—I am, etc.,

St. Ives, Cornwall. E. C. ATKINSON.

Urethral Instrumentation

SIR,—I wish to support Mr. Clifford Morson's plea for more efficient instruction in the use of urethral instruments (June 20, p. 771). There is, however, one statement in his letter which cannot be allowed to pass unchallenged. Surely it is not true to say that "a general practitioner will *benefit* his patient . . . by passing a catheter" in a case of acute retention. There are many dangers associated with this apparently simple procedure, not all of which will be obviated by efficient training.

Let us assume that the practitioner is able to avoid making a false passage and that his aseptic technique is above reproach, there are still the dangers of complete anuria and of haemorrhage, either from the kidneys or from the bladder, as the result of a too sudden decompression. It would probably be of more value to teach senior students when *not* to pass a catheter; acute retention due to an enlarged prostate would come at the head of the list. In my opinion such a case should be treated as an acute emergency and admitted immediately to hospital or nursing home before the retention is relieved.

I can recall many cases, as no doubt can Mr. Morson, where catheterization has added very considerably to the difficulties of the surgeon. This is particularly true of cases that are suitable for the perurethral operation by the Thompson punch or McCarthy's electrotome. In my experience this operation is not infrequently contraindicated as a result of interference by the practitioner.—I am, etc.,

Reading. GORDON L. BOHN.

Bacteriophage for Bacillary Dysentery

SIR,—I am very glad to observe the satisfactory report by Dr. Arthur Compton (June 13, p. 719) of the bacteriophage treatment of bacillary dysentery in Alexandria. It is, however, perhaps unfortunate that his paper had to be abridged as a war economy, since it is evident both from the paper and from results achieved in this country that despite earlier forebodings there is a future for this form of therapy. One would have liked more details of the actual form of administration and the source and potency of the bacteriophage used to compare with those adopted here in Britain. A considerable number of cases for which I have prepared and used both autogenous and stock bacteriophages in this country have obviously not allowed any number of dysenteries to be included; in fact the work has been largely carried out on staphylococcal cases and some various toxaemias associated with intestinal bacilli. Suffice it to say for the moment that the results are as satisfactorily significant and interesting as to be compared with advantage with those of modern chemotherapy with sulphonamides.

Results such as are reported by Dr. Compton must be of the greatest importance, and should be emphasized as an effective and rational form of treatment, especially in view of the very large concentrations of men in the Forces now in that country and among whom such epidemics must be rapidly controlled and effectively treated. To this end Morison even reports the prophylactic use of bacteriophage in well-water in Assam, and treatment by bacteriophage of cholera reduced the mortality in two series from 55% and 70% to 23% and 21%. Specificity and potency are two essential features, and we find that a phage lysate to be effective must be active in at least a dilution of 1 in 1,000,000. One wonders, therefore, what has happened to the unfortunate typhoid cases whose mortality is reported stationary at approximately 20%. It is as easy to prepare rapidly really potent specific bacteriophage solutions to this group of organisms as to the dysenteries, so that one must reasonably look forward to a further paper from Dr. Compton reporting a similar significant drop in the mortality of the typhoid group in Alexandria.—I am, etc.,

London, W.1. HARRY COKE.

[1] Hamilton Bailey's work; appendix at back.

Obituary

Dr. WILLIAM HENRY TURTON, who died at the end of April at the age of 79, had practised for many years at Heanor, Derbyshire, the town in which he was born. He studied medicine at the University of Edinburgh, graduating M.B., C.M. with first-class honours in 1886. He then began practice in Market Street, Heanor, and served for 54 years as medical officer of health for the Urban District, a post in which he is succeeded by his son Dr. Philip H. Turton. In every department of the town's life Dr. W. H. Turton used his knowledge and influence wisely and won the affection and respect of the whole neighbourhood. He was a man of many-sided tastes, with a deep interest in geology and zoology, on which he gave many public lectures. In Freemasonry he attained high honours. He had been a Justice of the Peace since 1916, and for some years deputy chairman of the Heanor Bench; he had also been warden of the Parish Church. In 1888 he began to take an active and prominent part in the work of the St. John Ambulance Association, becoming divisional surgeon and superintendent of the Heanor Ambulance Division, and afterwards county surgeon for the No. 5 District. He was appointed an officer of the Order of St. John after 32 years' service, and in 1935 was promoted to the rank of Commander of the Order. During nearly half a century of ambulance work he trained hundreds of candidates in first aid and left a lasting mark upon the efficiency of the district. Dr. Turton had been a member of the B.M.A. since 1912.

We regret to announce the death of Dr. WILLIAM GIBSON PARKER of Taunton, who was for many years assistant school medical officer under the Somerset County Council. He was born at Newcastle-upon-Tyne on July 30, 1878, the eldest son of the Rev. I. Parker, and was educated first at Wesley College, Sheffield, then at the Glasgow High School, and afterwards at the University of Birmingham and Guy's Hospital. He graduated M.B.Lond. in 1901 and took the Cambridge D.P.H. some years later. His early appointments were assistant house-surgeon at Guy's and assistant medical officer to the City Fever Hospital, Birmingham; then for a year he was medical superintendent at the Birmingham City Smallpox Hospital. Dr. Parker joined the British Medical Association in 1905, was honorary secretary of the West Somerset Branch 1924-7, and president in 1930-1. During the last war he served in the R.A.M.C. with the temporary rank of captain.

Dr. Bernard Leggett writes: I read with the greatest regret the obituary notice of Mr. GEORGE HUDDY, M.S., F.R.C.S. I was a student at the London Hospital when Mr. Huddy was registrar. At that time the manner of a few house-surgeons, registrars, etc., whose experience of life was bounded by hospital medical experience only, was on some occasions very irksome. Huddy was the opposite and showed to all an unfailing kindness and courtesy. Among my contemporaries he was greatly liked and appreciated, and the dresser or clerk who sought information from him would be treated with unfailing consideration and nothing was a trouble to him. Having attained the highest surgical distinctions, a future as a chief on "the London" appeared assured until he went to the Provinces, where first-class surgeons were becoming more in demand.

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UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examination indicated:

FINAL M.B.—*Part I (Surgery, Midwifery, and Gynaecology)*: J. N. Agate, R. J. Alcock, W. B. Alexander, A. G. S. Bailey, A. D. Barlow, H. W. A. Baron, D. J. Bauer, A. O. Bech, C. P. Bennett, N. L. Birkett, F. W. Blacklay, R. J. K. Brown, P. H. Buxton, T. O. Candler, A. W. Capon, E. F. Carr, F. S. Carter, J. M. Childs, J. A. H. Collyns, D. J. Conway, W. N. Coombes, P. N. Cunliffe, A. J. Danby, I. N. Darbyshire, J. Dean, P. J. R. Deller, W. K. Douglas, M. P. Durham, P. F. Early, A. G. Eddison, W. F. Felton, J. H. L. Ferguson, J. L. Fluker, T. R. Gilchrist, J. V. T. Gosling, A. G. Harrold, P. L. M. Hartley, D. Hilson, T. S. Hindle, R. F. Hollick S. C. H. Hood, P. H. S. Hooper, E. N. M. Johnston, H. R. Jolly, L. G. Kingdom, W. S. S. Ladell, F. M. Lancaster, F. K. Lau, T. L. T. Lewis, D. I. Lishman, G. C. Lloyd Roberts, J. Lomas, T. G. E. Loosemore, D. McAnally, I. M. MacArthur, E. L. McDonald, N. M. Mann, H. E. S. Marshall, P. H. N. Matthews, R. M. S. Matthews, H. R. A. Michelmore, P. A. G. Moaro, W. K. S. Moore, J. M. Morgan, Y. H. Ng, W. J. L. Pain, J. S. Pegum, J. A. Peters, R. V. Peters, H. L. Pierce, R. J. F. H. Pinsent, B. Pownall, E. Pringle, S. H. Purser, J. F. P. Quinton, R. K. Reid, W. Rogers, L. A. Rook, H. M. J. Rowan, I. A. Roxburgh, P. H. Sanderson, D. L. Sandes, O. L. S. Scott, T. O. Scudamore, J. H. Simpson, I. M. Smith, O. Sooklas, J. W. Squire, J. H. Steeds, J. P. Stephens, H. C. Still, J. R. Thompson, R. N. Ticehurst, W. H. Trethowan, G. S. Udall, C. R. M. Warner, D. J. Watt, L. A. S. White, E. N. Whitley, D. E. C. Whittome, H. I. Winner. *Women*: F. H. Lomax, A. B. Willcock.

UNIVERSITY OF LONDON

In a report on the work of the University of London the Acting Principal, Mr. Harold Claughton, states that the medical students in 1940-1 were nearly 90% of the number for 1938-9, whereas non-medical students were only 56%. The proportion of men to women in the medical schools is 90%, again contrasting with the non-medical schools, in which the sexes now are about equal. The dispersal of medical schools, with the clinical students distributed throughout sector hospitals in the Greater London area, has had its compensations in the more varied experience of the students and their greater opportunity for practical clinical work. Reference is made to the offer of the Rockefeller Foundation, made to Universities of the United Kingdom in general, of a number of studentships to permit students to follow a two-year course in medical schools in the United States and Canada. Six London students have been awarded such studentships, and, to avoid a technical interruption of their courses of study, the schools to which they have been sent have been recognized by the University for the purposes of the M.B., B.S. examination. The chair in radiology at Middlesex Hospital Medical School, which was instituted twenty years ago but to which no one has ever been appointed, is now to be filled. Regret is expressed at the postponement, owing to the war, of many university developments. This year four great buildings would have been opened, including the ceremonial hall.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of Council on June 11, with Sir Alfred Webb-Johnson, President, in the chair, the award of the Blane Medal to Surgeon Commander E. R. P. Williams, R.N., for his original work "A Hunterian Lecture on Blast Effects in Warfare" was announced. A report was made of the election as Hunterian Trustees of Lord Moyne, Sir Cuthbert Wallace, and Sir Hugh Lett. Surgeon Rear-Admiral C. P. G. Wakeley was appointed representative of the College on the Court of the University of Bristol and Mr. Ernest Finch was appointed representative on the Court of Governors of the University of Sheffield. The Hallett Prize, granted on the result of the Primary Examination for the Fellowship, was awarded to Miss Margaret Ruth Taylor of Manchester University. Examiners were elected for the ensuing year.

Diplomas of Fellowship were granted to the following candidates: S. G. French, G. N. St. J. Hallett, H. N. G. Hudson, A. J. Wilson, H. A. C. Chalmers, A. N. Guthkelch, T. W. Rowntree, J. H. Hicks, J. M. Fitton, W. I. Cawkwell, M. Gamal-el-Din, C. R. Salsbury, A. B. Watson, S. C. Williams.

Diplomas of Membership were granted to Janet W. Shrimpton and F. R. Wilde.

Diplomas in Anaesthetics were granted, jointly with the Royal College of Physicians of London, to the following candidates: Helen M. B. Alcock, R. E. Angel, T. H. Baillie, E. J. W. Barnard, J. R. J. Beddard, Stella G. Braithwaite, T. R. M. Bristow, A. Coleman, Florence K. Costello, J. P. Cuddigan, J. H. Dixon, J. D. Ebsworth, Phyllis M. Edwards, A. J. Evans, Mita Frost, Edith Gilchrist, G. P. Goodwin, J. R. Hindmarsh, A. R. Hunter, Jean E. W. Inglis, Edith S. M. Merry, R. E. J. Pembrey, S. F. Polley, Norah K. Priestley, H. J. Richards, G. K. T. Roche, G. F. Smith, A. E. Ward, F. Widlake, Gertrude A. Willis.

The Services

The A.F.C. has been awarded to Air Commodore P. C. Livingston, O.B.E., Acting Wing Commander R. H. Winfield, and Acting Squadron Leader E. B. Bright, R.A.F.

The Efficiency Decoration of the Territorial Army has been awarded to Lieut.-Col. G. P. Crowden, Major (Temp. Lieut.-Col.) D. L. Kerr, and Major C. E. Fenton, R.A.M.C., T.A.

The name of Acting Col. C. V. Thornton, M.C., R.A.M.C. (Reserve of Officers), attached to the Southern Rhodesia Medical Corps, has been mentioned in recognition of gallant and distinguished services in the Middle East.

The following officers have been mentioned in dispatches by Air Officers Commanding-in-Chief: Acting Group Capt. J. G. Russell, R.A.F.; Wing Commander D. H. Brinton, R.A.F.V.R., and Wing Commander J. H. Williams, A.A.F.; Squadron Leader C. W. S. Marris, R.A.F., and Acting Squadron Leaders F. R. Buckler, R. Carpenter, D. A. Davies, D. C. Farquharson, G. R. Gunn, S. J. Hadfield, and D. St. C. L. Henderson, R.A.F.V.R.; and Flight Lieut. J. N. Loring, R.A.F.V.R.

The King has approved the award of the George Medal to Acting Squadron Leader Robert Hill, R.A.F.V.R., Acting Flight Lieut. E. L. Williams, Leading Aircraftman C. J. Boarman, and Leading Aircraftman H. Sumray. The citation in a *Supplement* to the *London Gazette* dated June 8 reads as follows:

"One night in March, 1942, two aircraft, carrying bombs, collided on an aerodrome in Malta and burst into flames. Squadron Leader Hill (the station medical officer), Flight Lieut. Williams, and Leading Aircraftmen Boarman and Sumray immediately proceeded to the scene. Shortly afterwards the bombs began to explode and enemy aircraft began to bomb the area. Despite the great danger, Squadron Leader Hill, assisted by Flight Lieut. Williams and the two airmen, successfully extricated four members of the crews from the wreckage. The prompt and gallant action of these officers and airmen undoubtedly saved the four lives. Squadron Leader Hill has invariably performed exemplary work in dealing with casualties during heavy bombing raids, and both he and Flight Lieut. Williams have set a magnificent example which has done much to maintain a high standard of morale on the station. The bravery shown by Leading Aircraftmen Boarman and Sumray has been an inspiration to others."

CASUALTIES IN THE MEDICAL SERVICES

Surg. Capt. ALGERNON EDGAR PERCY CHEESMAN, R.N., who is included as killed in an Admiralty Casualty List published on June 10, received his professional education at Guy's Hospital and qualified M.R.C.S., L.R.C.P. in 1909. He held a house appointment at Leicester Infirmary before entering the Royal Navy as surg. lieut. in 1910. He was promoted surg. lieut.-cmdr. in 1921, surg. cmdr. in 1923, and was placed on the retired list in March, 1941, with the rank of surg. capt., but was re-employed for service during the present war. He had been a member of the B.M.A. since 1931.

Surg. Cmdr. DOUGLAS ARNOLD NEWBERY, R.N., who was reported missing in Dec., 1941, is now presumed to have been killed in H.M.S. *Repulse* on Dec. 10, 1941. He received his professional education at Guy's Hospital, qualified M.R.C.S., L.R.C.P. in 1926, and immediately entered the Royal Navy as surg. lieut., being promoted surg. lieut.-cmdr. in 1932 and surg. cmdr. in 1938. In Sept., 1926, he was appointed to the flotilla leader *Keppel*, for duty with the destroyers of the 3rd Flotilla; in 1929 he joined H.M.S. *Iron Duke*; and from 1930 to 1933 he was stationed at Gibraltar Dockyard. After further service afloat in H.M.S. *Renown* and H.M.S. *Terror* he was employed at Haslar Hospital from 1934 to 1937, when he was appointed to H.M.S. *Sussex*. He leaves a widow. He had been a member of the B.M.A. for 10 years.

Surg. Cmdr. THOMAS CLOVER LARKWORTHY, R.N.V.R., who is now officially presumed killed in H.M.S. *Neptune*, was 38 years of age, the son of Mr. and Mrs. G. Larkworthy. He graduated B.A. at Cambridge in 1924 and qualified M.R.C.S., L.R.C.P. in 1928, proceeding M.A. in the same year, also taking the B.Chir. degree in 1932 and the M.B. in 1937. He had been house-physician at the Brompton Hospital, resident obstetrical assistant, house-surgeon, house-physician, and casualty officer at St. George's Hospital, and clinical assistant at the Hospital for Women, Soho Square. At the outbreak of war he was senior clinical assistant at Brompton, and clinical assistant at the Victoria Hospital for Children and the infant welfare department of St. George's. He entered the R.N.V.R. before the war and in Sept., 1939, held the rank of surg. lieut.-

cmdr., being called up for service in December of that year. On Jan. 1, 1941, he was promoted to acting surg. cmdr. and was mentioned in dispatches. He leaves a widow.

Surg. Lieut.-Cmdr. HAROLD THEODORE LOGAN BROADWAY, R.N.V.R., is posted as missing, presumed killed in an Admiralty Casualty List published on June 24. He received his professional education at St. Thomas's Hospital, qualified M.R.C.S., L.R.C.P. in 1932, and then held the house post at the Royal Victoria and West Hants Hospital, Boscombe. He had been in practice in Dorchester since 1932, in partnership with Dr. T. B. Broadway, and was honorary anaesthetist to the Dorset County Hospital. He entered the R.N.V.R. as temp. prob. surg. lieut. soon after the outbreak of war and was reported missing in the *Journal* of March 21. He had been a member of the B.M.A. since qualification.

Surg. Lieut. JOHN WENLOCK ASHLEY, R.N.V.R., the elder son of Mr. and Mrs. L. Ashley of Tenbury, Worcestershire, is reported missing, presumed killed on active service last month. He was born on Sept. 27, 1914, and was educated at the University of Oxford, where he graduated B.M., B.Ch. in 1939. He entered the R.N.V.R. soon after the outbreak of war and was injured while serving in a destroyer in 1940. He had also seen service in H.M.S. *Hermione*.

Surg. Lieut. JAMES FREDERICK NEWMAN, R.N.V.R., who was reported missing in the *Journal* of Sept. 21, 1940, is now presumed to have been killed on active service when his ship, H.M.S. *Esk*, was sunk in the North Sea by enemy action in Sept., 1940. He was born on May 1, 1914, and was educated at Wycliffe College and the University of Birmingham, where he graduated M.B., Ch.B. in 1938. He had held house posts at the Staffordshire General Infirmary. In March, 1939, he entered the Supplementary Reserve of the R.N.V.R., and when war broke out he was mobilized with the rank of temp. surg. lieut., and saw service at the first Battle of Narvik and at the Dunkirk evacuation. He leaves a widow, Dr. Joan J. Newman, who is a member of the medical profession and who was his fellow student.

Wounded or Injured.—Prob. Temp. Surg. Lieut. R. P. M. Miles, R.N.V.R.

Missing.—Squadron Leader J. A. MacCarthy, R.A.F., Capt. C. Rigby, R.A.M.C., Lieut. E. Snell, R.A.M.C.

Prisoners of War.—Lieut. G. D. Cribb, R.A.M.C., Lieut. H. Rosenberg, R.A.M.C.

Medical Notes in Parliament

Health and Training of Youth

On June 16 the House of Commons considered the education estimates. Mr. BUTLER, President of the Board of Education, said that there was a substantial rise in the expenditure on education this year due, in part, to increased provision for meals and milk. The sum set aside for the youth service had also increased from £136,000 to £250,000. Over 700,000 children now took their midday meals at school. Last year 1,733 proposals providing for 240,000 children were approved, and from January to May of this year the number sanctioned was 3,642, providing for over half a million children. He saw no reason now why the target already mentioned of one million meals a day for children should not be reached by the end of the summer. He had consulted his medical advisers before making the statement that he believed the health of the children—largely thanks to these proposals and to the fact that some 3,250,000 children were now getting milk at school—had positively improved and that in wartime. It had been decided to extend to all schools the benefits of the milk-in-schools scheme, now confined to grant-aided schools. The result would be that all school children would be able to get milk for drinking at the price of ½d. per one-third of a pint.

With regard to the school medical and dental services, the volume of treatment given to school children in 1941 was almost as great as in 1940 and the years immediately preceding the war. That was not to say that everything was all right. The loss of doctors to the Services had been very severe, but the Board was doing its best to meet the situation. The Board had stimulated the formation of new nursery classes and play centres to look after the children of women engaged in war work, and for this purpose a new department had been established in Kingsway. He was determined that the educational value of the wartime nurseries should find full scope. Perhaps a more direct contribution by the schools to the war effort was the steady flow of qualified recruits for the Services which came from the secondary schools. The technical colleges all over the country had been given over very largely to the training of expert personnel for the Services.

Youth Advisory Council

Referring to the youth service, he said that every authority for higher education now had a youth committee and a substantial number of local organizers had been appointed. To help in the growth and expansion of the movement, he had felt the need for some closer contact with those connected with the actual work, and he proposed accordingly to appoint a Youth Advisory Council. This council was the first attempt to include in one body many types working among our youth—administrators, members of youth committees, and younger people engaged in this work, whether in voluntary or pre-Service organizations. One member was a chairman of a Juvenile Court, and there would be those who could speak with knowledge of the employer's and employee's point of view. The chairman would be Mr. Wolfenden, headmaster of Uppingham. The great mass of children broke off their education suddenly at about the age of 14, Parliament voted millions in the estimates, and then ceased to exercise a continued care and supervision over adolescents. This loss would not be obviated merely by raising the age for full-time schooling to 15 or even to 16, though we should take the former step when we got the chance. The new registration scheme had already recognized that up to at least 18 young people should be regarded as still falling within the province of the education service. He hoped the Youth Advisory Council would be an advance along the road to a more integrated national service for youth. To do what was right by the health and the welfare of the young people not only was continued supervision necessary, but the young people must be treated as learners and not simply as earners in their first years in employment. In the interests of youth, as well as out of consideration for our future industrial and commercial welfare, the time had come to review the whole system of industrial and commercial training, including the apprenticeship systems.

After debate, the discussion on the estimates was adjourned.

Committee on Child Welfare

Mr. ERNEST BROWN told Miss Rathbone on June 11 that an advisory committee on the welfare of young children had been constituted. He would act as chairman, with Miss Horsbrugh as vice-chairman. The committee would advise him on any question affecting the welfare of expectant and nursing mothers and of children under 5 which are referred to it. It would do most of its detailed work through subcommittees appointed for the investigation of particular problems. The medical members of the Committee are Dr. Ethel Cassie, Dr. Letitia Fairfield, Dr. Dennis Geffen, Dr. William S. Macdonald, Dr. Alan Moncrieff, Dr. Annie Rowlands, Dr. Charles M. Smith, Mr. Arnold Walker, and Dr. Edith Williamson.

Period of Clinical Studies

On June 11 Sir E. GRAHAM-LITTLE asked Mr. Brown to address simultaneously and in the same terms his request, now sanctioned by the General Medical Council, to all the medical licensing bodies in Great Britain so as to avoid the inequality of sacrifice which must result from sporadic action on the part of individual licensing bodies. Mr. BROWN said the General Medical Council had communicated on this question with all licensing bodies and examining boards in Great Britain and Northern Ireland.

Psychoneuroses and Pensions

Replying on June 11 to Lieut.-Comdr. Hutchison, Sir WALTER WOMERSLEY said the grant of pension for any disability, including psychoneurosis, depended on whether the condition was accepted as attributable to or materially aggravated by service. It could not be assumed that a disability could be so accepted simply because it led to discharge from the Service. The question must be determined in each case in the light of the nature of the disability and the service and medical history of the claimant. Provision was made by the Ministry of Pensions for the treatment in special neurological centres under the E.M.S. of men discharged from the Services suffering from a condition of neurosis, provided they were likely to benefit by such treatment. This treatment was granted whether the condition was accepted by the Ministry or not.

Maternity Beds in Scotland

On June 16 Mr. JOHNSTON told Dr. Summerskill that 42 of the 55 Scottish local authorities with power to provide maternity beds had done so either in special maternity hospitals, of which there were 22 with 555 beds, or in general hospitals,

where there were 400 maternity beds. There were also in Scotland 700 maternity beds in voluntary hospitals, and 300 beds in 10 maternity hospitals provided by the Government for expectant mothers who had been evacuated, but which in practice were also used for other patients. There was, therefore, a total provision of nearly 2,000 maternity beds in the country. Local authorities did not specifically allocate beds as free ones; they charged according to the patients' means, and in necessitous cases no charge was made.

Eye Injuries in Ordnance Factories

On June 17 Sir ANDREW DUNCAN told Sir Francis Fremantle that returns of eye injuries at Royal Ordnance Factories had not hitherto been abstracted from case records, but arrangements had now been made to obtain these returns. Adequate preventive measures were taken by the provision of guards or goggles where necessary. Minor injuries were treated at the factory surgery, but where the injury was serious the employee was sent to hospital.

Silicosis Disablement

On June 16 Mr. NESS EDWARDS asked the Home Secretary the number of claims for silicosis certificates made by South Wales coal-miners to the Medical (Silicosis) Board. Mr. PEAKE said that 658 applications for disablement certificates were made in 1939, of which 271 were refused; in 1940, 825 were made and 396 refused; and in 1941, out of 1,136 applications, 662 were refused.

Civilian Medical Services

Mr. DUNCAN SANDYS, answering Mr. T. E. Harvey on June 18, said the allocation of doctors for the needs of the fighting Services, in relation to those of the civilian population, was based on a careful system of priorities worked out by the Medical Personnel Priority Committee set up by the Minister of Health, the Secretary of State for Scotland, and the three Service Ministers. Many medical officers had already been granted temporary release from the Army to meet civilian needs. This practice had been in force for over twelve months and the War Office would maintain it as fully as the needs of the Service allowed.

Mr. BROWN announced on June 18 that the Secretary of State for War had agreed in principle to the temporary loan to understaffed civilian hospitals of Army nurses who could be spared. Details were under discussion. There was a standing arrangement under which Army doctors would give all possible assistance to a civil hospital if required in an emergency. Medical Personnel Priority Committees in each Region had constantly under review the co-ordination of military and civil hospital services.

Mr. IVOR THOMAS, on the same date, asked Mr. Brown to undertake that, before any more general practitioners were released for the Services, the E.M.S. would be reduced to a size more comparable with proved needs. Mr. BROWN answered that a percentage reduction in the whole-time medical staffs of hospitals, including those enrolled in the E.M.S., was already being carried out in the light of the proved needs of the hospitals. In addition, the period for which hospital appointments might be held by recently qualified doctors liable to military service had been restricted. The reduction of hospital staffs was, therefore, proceeding concurrently with the call for more general practitioners for the Services.

Family Allowances

On a motion by Wing Commander Wright, in the House of Commons on June 23, commending for the Government's consideration a national scheme of allowances for dependent children, Sir KINGSLEY WOOD said that even if the principle of family allowances was accepted there were a number of important matters which still remained to be decided: whether such a scheme should be contributory or non-contributory; whether its benefits should be extended to families of all incomes or be confined to the poorer ones; whether it should be confined to the larger families by excluding the first eligible child or the first two eligible children in each family. There were also much wider and more important considerations about the effect of family allowances on the present wartime economy, particularly if given on a large scale and paid in cash. If the motion were adopted, the Government would give full consideration to the matter in the light of the Beveridge report, the further conclusions of organized labour, and the financial position. It should be possible for all these matters adequately to be considered in the autumn. They would be given immediate attention, conclusions would be reached as rapidly as possible and communicated to the House, when, no doubt, there would be occasion for further discussion.

Medico-Legal

A FATAL OVERDOSE OF CARBACHOL

Carbachol became official in the Third Addendum to the *British Pharmacopoeia, 1932*. Chemically it is carbamylcholine chloride, the urethane of choline. It is sold in this country under the proprietary names of "moryl" and "choryl." A foreign proprietary of similar composition was formerly marketed here under the registered name "doryl." Carbachol is officially described as consisting of "small, colourless, hard, prismatic crystals, or a crystalline powder." The dose by mouth is 0.001 to 0.004 g. and by subcutaneous injection 0.00025 to 0.0005 g. It is soluble in equal parts of water. The effects are like those of acetylcholine—that is to say, it is a powerful vasodilator and cardiac depressant. Carbachol stimulates the parasympathetic nervous system. It causes contraction of the intestinal and bladder muscle, and is used subcutaneously or intramuscularly to relieve post-operative intestinal atony and promote micturition due to atony of the bladder wall. Its action by the mouth is less certain than by injection. In comparison with acetylcholine the effects on the gastro-intestinal tract and the bladder appear to be greater, and those on the cardiovascular system less (F. R. Fraser, *Journal*, 1938, **1**, 1293). Its great value is in the relief of urinary retention not due to obstruction.

The *Oxford Mail* of June 4 printed a full report of an inquest held by the city coroner, sitting with a jury, on Flight-Sergeant J. Simpson, R.A.F., aged 41, who died in the E.M.S. department of the Cowley Road Hospital after an overdose of "moryl." The charge-sister said that on May 11 a representative of a local firm of chemists called as usual on his daily visit, and among other things she ordered ampoules of "moryl," but did not indicate any specified form. She expected it to be supplied as a liquid, with which form she was familiar. She opened the box on May 19 for the purpose of giving an injection to Sergeant Simpson on the instructions of Dr. Lovas. She noticed that the drug was in crystals and was a little surprised not to find it in liquid form, though she had seen the crystal type a few days before when another sister had asked for some "moryl" out of her store. She dissolved the crystals in the ampoule in sterilized water and gave the injection at 11.50 a.m. She did not then know that the dosage of one ampoule applied only to liquid "moryl" and not to crystal "moryl." There were no instructions on the box stating that crystal "moryl" was not to be used for injection. Another sister gave evidence that a nurse whom she had sent to watch Sergeant Simpson immediately after the injection while she herself served dinner reported that he was breathing strangely. She found him almost pulseless, very blue, gasping, and in a collapsed condition. She sent for the doctor and started applying oxygen, but the patient died at 12.5 p.m. before the doctor's arrival. The manager of the branch pharmacy gave formal evidence of receipt and delivery of the drug. He did not know that "moryl" was done up in both liquid and crystal form. When he ordered the drug from Savory and Moore's Oxford establishment by telephone he was not asked if he required it in liquid, crystal, or tablet form. Evidence was then given regarding a patient in the same hospital who had an ampoule of "moryl" on April 9, and collapsed, but recovered after oxygen; and another patient, who had had an ampoule of liquid "moryl" without ill effect on May 9, but collapsed after administration of an ampoule of crystal "moryl" dissolved in water on May 10 and recovered from this under treatment. In reply to the coroner the sister said that she expected that one ampoule of crystals dissolved in sterilized water would be the same as one ampoule of liquid "moryl." The factory manager of Savory and Moore's said that boxes of "moryl" in crystal form were sometimes sent out with instructions and sometimes without. The general practice with hypodermic injections was not to issue any instructions as to the way they were to be injected. His firm had been making "moryl" for two years and there had been no previous complaint about its use. Dr. A. Lovas, a medical graduate of Prague serving in the E.M.S. department at the hospital, said that on the day after the operation on Simpson for haemorrhoids he gave instructions for an injection of one ampoule of "moryl" to be given. Several months earlier he had read the instructions given on a box of ampoules of liquid "moryl," and being unaware that "moryl" was supplied in crystal form he thought it sufficient to give instructions for a patient to have one ampoule of "moryl." If he had known that in two earlier cases of collapse crystals had been used instead of liquid, that would certainly have put him on inquiry. Dr. A. H. T. Robb-Smith, director of pathology at the Radcliffe Infirmary, who had conducted a post-mortem examination, gave the

opinion that death was caused by an overdose of the drug. The jury returned a verdict of death due to an overdose of "moryl" accidentally given, and added a rider: "We consider that the method of handling the drug at the hospital and the manner of labelling the drug by the manufacturers are both deserving of censure."

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* during the week there was a rise in the notifications of whooping-cough 213, diphtheria 54, and cerebrospinal fever 13; and a fall in measles 624, acute pneumonia 107, dysentery 45, and scarlet fever 33. The largest rises in the incidence of whooping-cough were in Warwickshire and London, where 51 and 41 cases more than in the preceding week were notified.

Diphtheria, with a rise of 54, due to the experience of Wales and Northern England, reached almost the level of the last three weeks in May. The lower incidence of measles was more pronounced than last week, although the decline was not general throughout the country. The largest decreases were those of London and Surrey, 157 and 140 less than the totals of the preceding week. The high level of incidence in Kent and Lancashire remained unchanged, whilst the notifications in Durham rose by 51. The lower incidence of scarlet fever was mainly due to the experience of London and of Wales. In Yorks West Riding and Kent there was a slight increase in notifications. Eleven more cases of dysentery were reported from Yorks West Riding, Wortley R.D., and this was the only outbreak of any note during the week.

In *Scotland* a fall in the incidence of infectious diseases was reported, dysentery, with an increase of 9 cases, being the only exception; 714 cases of measles, 186 fewer than in the preceding week, were notified in Glasgow.

In *Northern Ireland*, in Belfast, the notifications of measles numbered 342, a decrease of 26, but as only the first case in a household has to be notified, unless two months intervene between cases, the actual number is probably larger.

Quarterly Return of the Registrar-General for Scotland

The report for the first quarter of 1942 shows that Scotland enjoyed a very favourable mortality experience, particularly from infectious diseases. The marriage rate of 10.3 per 1,000 was the highest ever recorded for any first quarter in Scotland.

Live births numbered 21,881 and corresponded to a rate of 17.7 per 1,000 of the population, which was 0.1 below the average for the March quarter for the five years 1937-41. The illegitimate births were 7.0% of the total and were 1.0 above the average. The infant mortality rate—90 per 1,000 live births—was an improvement on previous experience. This rate was 19 below that for the first quarter of 1941 and 7 below the five-year average. Maternal mortality was 5.3 per 1,000 live births—an increase of 0.4 on the average of the preceding five years for the first quarter.

19,441 deaths were registered during the quarter, equivalent to a rate of 15.7 per 1,000 of the population. This rate was 3.2 below that recorded in the corresponding quarter of 1941 and 1.8 below the five-year average. There were only 411 deaths from the principal epidemic diseases—about one-third of the number recorded in the first quarter of 1940. The death rate from these causes was 33 per 100,000 of the population—about one-quarter of the five years' average rate for the March quarter. The death rates for all forms of tuberculosis were 57 per 100,000 and 67 for respiratory tuberculosis; these rates showed practically no change from the five-year average. Despite the severity of the winter the death rate for both bronchitis and pneumonia was only 89 for each cause as compared with 130 and 135 respectively, the average rate for the first quarters of the five preceding years.

Returns for the Week Ending June 20

The notifications in England and Wales during the week included the following numbers: scarlet fever 1,317, whooping-cough 1,389, diphtheria 660, measles 6,629, acute pneumonia 593, cerebrospinal fever 104, dysentery 71, paratyphoid 9, typhoid 7.

Outbreak of Small-pox

According to statements in the Press there have been up to date 22 cases of small-pox in Glasgow. Of 7 patients from a ship 2 have died; 4 cases of small-pox have also been reported in the Swindon area.

No. 23

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended June 13.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1942					1941 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	140	8	28	1	5	224	16	47	2	11
Deaths		1	1				2	5		
Diphtheria	637	27	145	56	21	818	45	196	24	25
Deaths	12	—	1	2	—	21	3	3	1	—
Dysentery	55	3	54	—	—	114	5	59	—	—
Deaths				—	—			—	—	—
Encephalitis lethargica, acute	—	—	—		—	1	—	—		—
Deaths		1					—	—		
Enteric (typhoid and paratyphoid) fever						161	10	33	3	3
Deaths						2	—	1	—	—
Erysipelas			32	4	1			41	6	1
Deaths							—	—		
Infective enteritis or diarrhoea under 2 years				50						
Deaths	30	4	14	8	3	43	3	9	5	3
Measles	6,655	699	830	65	342	11,597	357	167		19
Deaths	6	2	4	1	3	9	1	1	1	—
Ophthalmia neonatorum	98	2	17		1	67	—	6		—
Deaths										
Paratyphoid fever	7	1	—							
Deaths	—	—	—		—					
Pneumonia, influenzal*	687	27	19	3	2	816	31	2	3	—
Deaths (from influenza)	5	—	1	—	—	10	2	3	—	7
Pneumonia, primary			209	21				169	9	
Deaths		12		8	5		31		10	
Polio-encephalitis, acute	1	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	6	—	—	—	2	7	1	2	—	
Deaths		—					—	—		
Puerperal fever	—	4	12	2	2	1	1	15	3	1
Deaths		—					—			
Puerperal pyrexia	151	11	18		3	122	5	28		
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,025	65	200	62	39	962	51	152	37	29
Deaths	4	—	—	—	—	—	—	—	—	—
Small-pox	—	—	2		—	—	—	—		—
Deaths	—	—		—	—	—	—	—	—	—
Typhoid fever			3	5	2					
Deaths			—	—	—					
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,350	144	48	42	12	3,774	135	312		2
Deaths	5	1	1	4	1	24	1	8	—	—
Deaths (0–1 year)	287	38	58	39	23	293	9	40	30	8
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	3,797	567	529	224	102	4,412	558	664	214	127
Annual death rate (per 1,000 persons living)			11·9	15·0	†			14·5	14·2	—
Live births	5,463	569	871	557	261	4,620	334	911	304	173
Annual rate per 1,000 persons living			18·0	37·2	†			18·5	20·2	—
Stillbirths	227	28	41			187	14	40		
Rate per 1,000 total births (including stillborn)			45					42		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Medical News

Prof. Major Greenwood, F.R.C.P., F.R.S., will give a public lecture on "Civilian Hazard of Life in this War and in the Last: A Profit and Loss Account for 1915-16 and 1940-1" at the London School of Hygiene, Gower Street, W.C., on Thursday, July 16, at 2.30 p.m.

The thirty-first Long Fox Memorial Lecture will be delivered in the Lecture Theatre of the H. H. Wills Physics Laboratory (Royal Fort), University of Bristol, on Tuesday, July 7, at 8.30 p.m., by Prof. C. M. Yonge, D.Sc., whose subject is "The Experimental Study of Development."

The London and Home Counties branch of the Child Health Planning Group will hold its inaugural meeting at 13, Hill Street, Berkeley Square (British Dental Association headquarters), on Saturday, July 18, at 2.30 p.m.

The name of Col. Robert Bruce, D.S.O., M.D., Deputy Lieutenant for the County of Aberdeen and chairman of the Territorial Army Association for the County of Aberdeen, was omitted from the list of Birthday Honours published in the *Journal* of June 20. He received the C.B. (Civil Division).

The Heberden Society has awarded the Heberden Medal for Research in Rheumatic Diseases for 1942 to Dr. Philip S. Hench of the Mayo Clinic, Rochester, Minnesota, in recognition of his distinguished contributions to the subject over a number of years, and particularly of his most recent work on the effect of jaundice on the course of rheumatoid arthritis.

The 89th annual general meeting of the Governors of Epsom College was held on June 19 at 49, Bedford Square, London, W.C. In moving the adoption of the Council's report, Lord Leverhulme, the President, congratulated the Treasurer, Council, headmaster, and bursar for the way in which they had tackled the burdens of an exceptionally difficult year, which showed a reduction in numbers and a financial loss. The report was unanimously adopted, and the Governors received the announcement of Foundation scholarships, pensions, and educational grants awarded by the Conjoint Committee in May.

The Queen has allocated £2,000 from the "Bundles for Britain" Fund to the Belfast Hospital for Sick Children towards the establishment of a child guidance clinic.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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QUERIES AND ANSWERS

Coltsfoot

"TUSSILAGO" writes: Can any colleague put me wise about coltsfoot, said to be good for asthma? Should the leaves be young or mature? How are they cured? I read that coltsfoot was smoked before the arrival of tobacco in this country, and that Pliny advised that the smoke from the burning leaf be inhaled through a reed. Information about the manufacture would interest me.

Blood Slides in Heat Pyrexia

Wing Commander S. B. S. SMITH (R.A.F. Medical Branch) writes: I note that Surg. Lieut.-Cmdr. Corr in his article on treatment of heat pyrexia by lumbar puncture (June 20, p. 761) makes no mention of blood slides being taken to exclude malaria. Hyperpyrexial malaria is not uncommon when high atmospheric temperature is combined with high humidity. Were blood slides taken at a later date, and if so with what result?

Income Tax

Assistant's Accommodation

D. S. pays his assistant a salary, etc., "and £113 allowance for rent and rates of a furnished house which he has taken." He understands that if he pays the rent himself the assistant would not have to account for tax on the £113; but could he (D. S.) continue to deduct that amount as a professional expense?

*** The reply cannot be given in quite such simple terms. If D. S. had taken the furnished house and required the assistant to live in it, he could have deducted the £113 as a professional expense and the assistant would not have been liable to tax on it, as the benefit would not have been convertible by him into money. But as matters stand payment of the £113 is a monetary liability of the assistant, and if D. S. discharges that liability for him the effect is the same as if he had paid him that amount in cash. If the tenancy and service agreements are altered making D. S. the tenant and requiring the assistant to live in the house provided, the assistant will cease to be liable to tax on the £113 as from the effective date of the change, and D. S. will still be entitled to deduct that amount as a professional expense; but until such a change is made no difference in the legal position with regard to income tax would be created merely by the rent and rates of the premises being paid by D. S. instead of by the assistant.

LETTERS, NOTES, ETC.

A Family History of Intussusception

Mr. JOHN J. LISTON, honorary surgeon to the Royal Portsmouth Hospital, writes: In May this year I operated on Sylvia X, aged 4 months, for intussusception. It was of the ileo-caecal type and early. She was the 14th child of the family. The mother stated that several of her children had suffered from the condition previously. On inquiry the following history was obtained. Reginald X died after operation for intussusception; age and date not known as the records have been "blitzed." Leslie X, aged 9 months, died after operation on April 5, 1930, for intussusception. Kenneth X, operation for intussusception on July 30, 1939, aged 3 years, alive and well. Ronald X, operation for intussusception on March 3, 1933, aged 5 months. Again operated on for intussusception on July 7, 1933; alive and well. Sylvia X, case quoted above, alive and well.

Blood Groups in Nullity Suit: Correction

We regret the clerical error by which, in the note under this title which appeared in our issue of June 20, p. 776, the child's blood group was given as ABN instead of ABMN. The mistake did not contradict the double exclusion of the husband (OM) from paternity which was the outstanding feature of the case, but had the effect of also excluding the mother (BM).

MEDICINE 100 YEARS AGO

Extract from the *Provincial Medical Journal* of July 2, 1842:

"The peaceful but arduous labours of the medical man render peculiarly obnoxious to him the heart-burnings, jealousies, and strifes engendered by the present condition of medical affairs. To continue his way, quietly and respectably, in the exercise of his profession, benefiting mankind by his science, while he procures for himself and his family the means of honourable existence, is the main object of his ambition. To pursue this object in peace is impossible under the existing state of medical affairs. The conflicting interests of our rulers have entailed upon us the curse of the disobedient son; the hand of the medical man is incessantly raised against his brother; laws and regulations, with the enactment of which we have no concern, have created a diversity of interests in our community, and introduced confusion and strife into a commonwealth where harmony of feeling and identity of interests should have prevailed; the character of the medical man is thus lowered in his own eyes, while the public estimation which he enjoyed is deteriorated in a still greater degree. These facts are brought home to every member of the profession in all parts of the empire. At one time the demand for medical reform was but a low and confused murmur; it is now the voice of the many—strong in number, and confident in the justice of their cause. But what is the measure of reform which we ask?—what the amendment which the enemies of reform affect to represent as a destruction of ancient institutions, prompted by a vague and restless love of change? The majority of reformers—those with whom all prudent and true friends of the profession are prepared to act—require nothing very violent in action, or destructive in its effects; they simply ask, as a fundamental measure, the institution of an uniform qualification for all persons who shall hereafter enter the medical profession; and, as a necessary consequence, they demand an equality of privileges for all those who shall have thus obtained an uniform qualification."